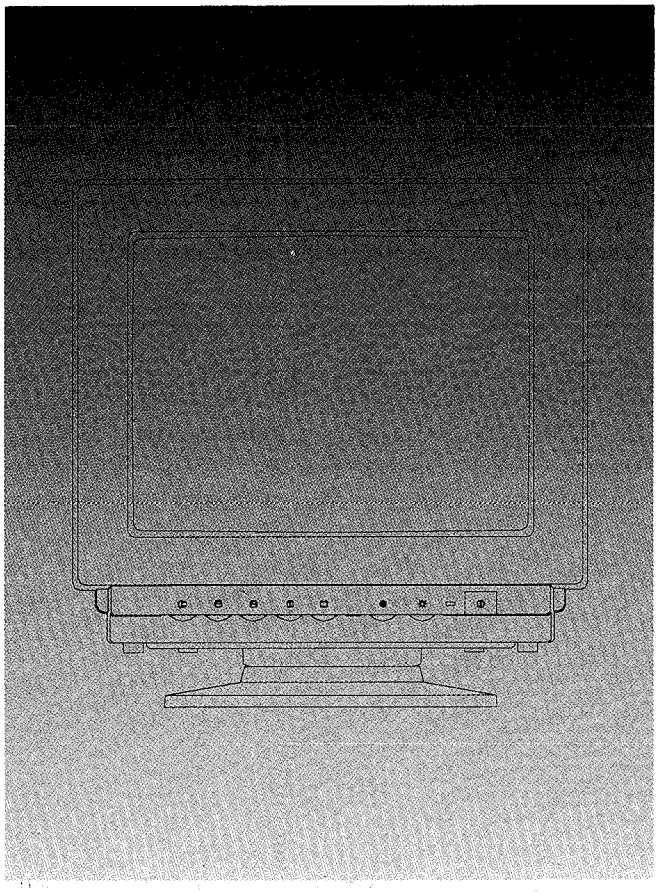
SAMSUNG

COLOR MONITOR

CQA4147/CQA4147L (SyncMaster 3)
CQA4143/CQA4143L
CQA4157/CQA4157L
CQA4153/CQA4153L

SERVICE Manual

COLOR MONITOR



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CQA41** Series Service Manual

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1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heat sinks are potential shock hazards.

1-1-2 Servicing the High Voltage System and Picture Tube

1. When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (Disconnect the AC line cord from the AC outlet.)
2. Do not lift the picture tube by the neck.
3. Handle the picture tube only when wearing shatterproof goggles and after completely discharging the high voltage anode.

1-1-3 X-Rays and High Voltage Limits

1. Keep the high voltage below the specified maximum level. Be sure all service personnel are aware of the procedures and instructions covering X-rays.
   The only potential source of X-ray in current solid state display monitors is the tube. However, the picture tube does not emit measurable X-ray radiation if the high voltage is as specified in the fire and shock hazard instruction. Only when high voltage is excessive are X-rays capable of penetrating the shell of the picture tube, including the lead in glass material.
2. It is essential that service technicians have an accurate high voltage meter available at all times. Check the calibration of this meter periodically.
3. High voltage should always be kept at the rated value, no higher. Operation at high voltages may cause failure of the picture tube or high voltage circuitry and, also under certain conditions, may produce X-rays in excess of acceptable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-ray problem. Test the brightness and use a meter to monitor the high voltage each time a color monitor comes in for service. Make sure the high voltage does not exceed its specified value and that it is regulating correctly.
5. The picture tube is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type or equivalent as the original. Carefully reinstall the picture tube shields and mounting hardware; these also provide X-ray protection.
6. When troubleshooting a monitor with excessively high voltage, avoid being unnecessarily close to the monitor. Do not operate the monitor longer than is necessary to locate the cause of excessive voltage.

1-1-4 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment cover or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

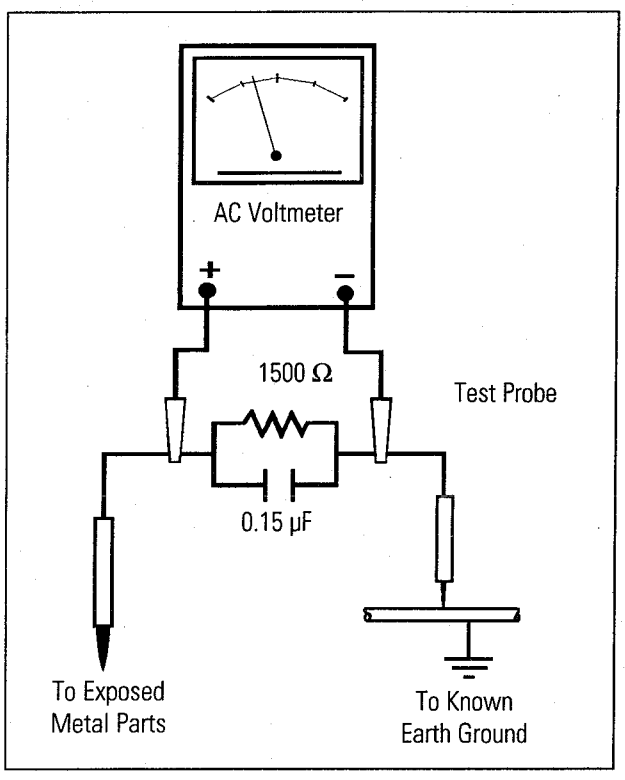


Figure1-1. Leakage Current Test Circuit

3. To be sure that no shock hazard exists, check for leakage current in the following manner:

   a. Plug the AC line cord directly into a 120 Volt AC outlet. (Do not use an isolation transformer for this test)

   b. Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with an exposed metal cabinet part and a known earth ground, such as an electrical conduit or electrical ground connected to an earth ground.

   c. Use a SSVM or VOM with 1000 ohms per-volt or higher sensitivity to measure the AC voltage drop across the resistor (see Figure 1-1).

   d Connect the resistor to an exposed metal part having a return path to the chassis (metal cabinet, screw heads, knobs, shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

   e. Any reading of 5.25 Volt RMS (this corresponds to 3.5 milliampere AC) or more is excessive and indicates a potential shock hazard. Correct the shock hazard before returning the monitor to the user.

1-1-5 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

Warning: An electrolytic capacitor installed with the wrong polarity might explode.

Caution: Before servicing instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1 General Servicing Precautions

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect an electrical plug or connector, (c) connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution : Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9. ⚠ marks parts for ESDs on schematic diagrams and electrical parts list.

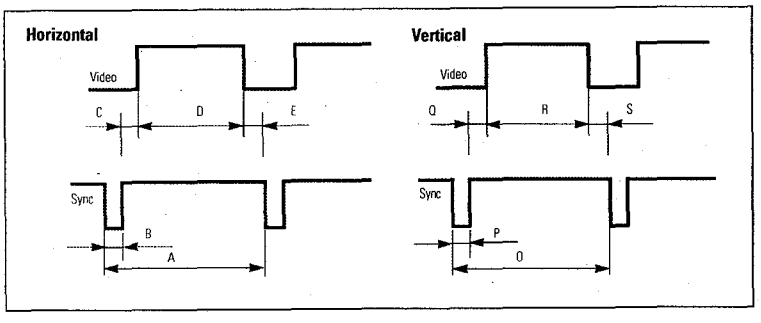
2 Reference Information

2-1 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

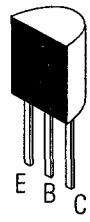
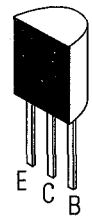
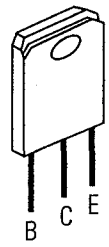
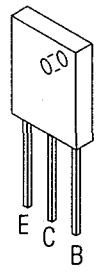
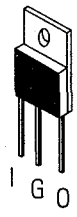
Table 4-1. Timing Chart

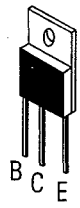
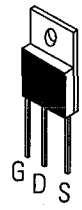
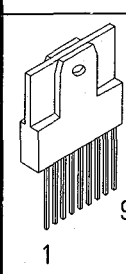
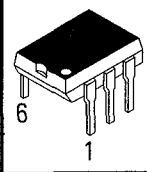
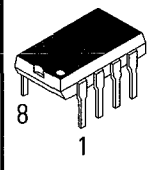
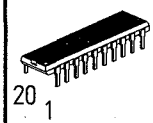
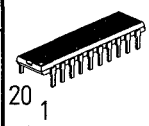
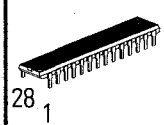
Mode / Timing	IBM				VESA			
	VGA1/70 Hz 640x350	VGA2/70 Hz 720x400	VGA3/60 Hz 640x480	XGA87hz 1024x768	640/72 Hz 640x480	800/60 Hz 800x600	800/56 Hz 800x600	640/75 Hz 640x480
fH (kHz)	31.469	31.469	31.469	35.522	37.861	37.879	35.156	37.500
A µsec	31.778	31.777	31.778	28.151	26.413	26.400	28.444	26.667
B µsec	3.813	3.813	3.813	3.920	1.270	3.200	2.000	2.032
C µsec	1.907	1.907	1.907	1.247	4.064	2.200	3.556	3.810
D µsec	25.422	25.422	25.422	22.806	20.317	20.000	22.222	20.317
E µsec	0.636	0.636	0.636	0.178	0.762	1.000	0.667	0.508
fV (Hz)	70.087	70.087	59.940	86.958	72.809	60.317	56.250	75.000
O msec	14.268	14.268	16.683	11.500	13.735	16.579	17.778	13.333
P msec	0.064	0.064	0.064	0.113	0.079	0.106	0.057	0.080
Q msec	1.907	1.080	1.048	0.563	0.739	0.607	0.626	0.427
R msec	11.122	12.711	15.253	10.810	12.678	15.840	17.067	12.800
S msec	1.176	0.413	0.318	0.014	0.237	0.026	0.028	0.027
Clock Frequency (MHz)	25.175	28.322	25.175	44.900	31.500	40.000	36.000	31.500
Polarity H.Sync / V.Sync	Positive / Negative	Negative / Positive	Negative / Negative	Positive / Positive	Negative / Negative	Positive / Positive	Neg/Pos / Neg/Pos	Negative / Negative
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate



A : Line time total	O : Frame time total
B : Sync width	P : Sync with
C : Back porch	Q : Back porch
D : Active time	R : Active time
E : Front porch	S : Front porch

2-2 Semiconductor Lead Identification

PARTS	TYPE NO.	REF. NO.
	KSC1008-Y	Q404
	KSC733C-Y KTA1266-Y	Q401, Q405, Q407, Q410, Q501
	VN2222LL	Q205
	KSC945C-Y KTC1398-Y	Q201, Q202, Q203, Q204, Q206, Q402, Q409, Q502, Q601, Q607
	2SC4744 2SC4762 KSC5086 2SC5149	Q403
	6N80 2SK1358	Q602
	MTE800 KSE800	Q406
	MC7805 KA7805	IC202
	KA317 LM317	IC603

PARTS	TYPE NO.	REF. NO.
	KSC1507	Q603
	IRF9610	Q408
	TDA4866	IC301
	CQY80-NG CQR80-XG	OP601
	KA3882	IC601
	TDA4850	IC401
	SL605	IC201
	LM1203 KA2139	IC101
	LM2406T	IC102

3 Product Specifications

3-1 Specifications

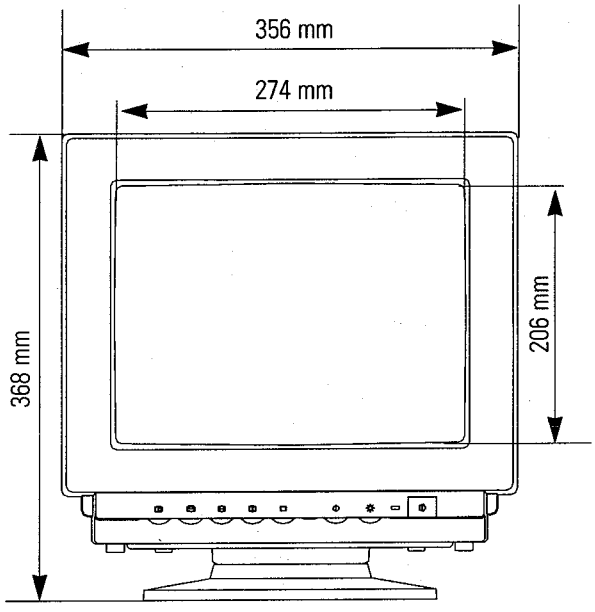
Item \ Model	CQA4147/CQA4157	CQA4143/CQA4153
Picture Tube:	14-inch (36 Cm), 13.2-inch (33.5Cm) visual; Full square/regular face tube, 90° Deflection; Antistatic silica coating; AK shadow mask	
	0.28 mm Dot pitch; Non-glare	0.39 mm Dot pitch; Non-Glare
Scanning Frequency Horizontal / Vertical	31.47kHz/70 Hz, 31.47kHz/60 Hz,35.52kHz/87 Hz, 37.5kHz/75 Hz, 37.86kHz/72.8 Hz, 35.16kHz/56 Hz, 37.88kHz/60.3 Hz	
Display Colors Analog Input	Unlimited Colors	
Maximum Resolution	Horizontal : 1024 Dots Vertical : 768 Lines	
Input Signal Video Separate Sync	 Analog 0.714 Vp-p Positive at 75 Ω Terminated TTL level Positive/Negative	
Maximum Pixel Clock	45 MHz	
Active Display	Horizontal : 255 mm ± 3 mm Vertical : 191 mm ± 3 mm	
Input Voltage	AC 90-264 Volt, 60/50Hz±3 Hz	
Power Consumption	70 Watt (max)	
Dimensions	Unit (H x W x D) : 14.5 x 14 x 14.9 Inches (368 x 356 x 379.5 mm) Carton (H x W x D) : 18.2 x 18 x 15.7 Inches (462 x 457 x 398 mm)	
Weight	Net/Gross: 23.2 Lbs (10.5 kg) / 27.6 Lbs (12.5 kg)	
Environmental Considerations	Operating Temperature: 32° F to 104° F (0° C to 40° C) Humidity : 10 % to 80 % Storage Temperature : -4° F to 113° F (-20° C to 45° C) Humidity : 5 % to 95 %	

- **Notes :** 1. Designs and specifications are subject to change without prior notice. Model numbers with an "L" suffix comply with SWEDAC (MPRII) recommendations for reduced electromagnetic fields.
- **Notes :** 2. This manual covers the following models.

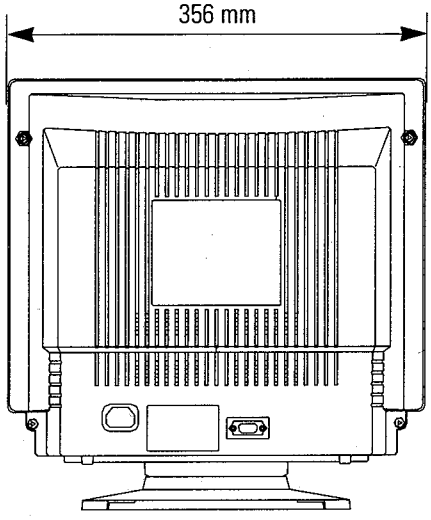
CRT Screen	CRT Dot Pitch	1414 Cabinet		1415 Cabinet	
Non Glare	0.28 mm	CQA4147	CQA4147L	CQA4157	CQA4157L
	0.39 mm	CQA4143	CQA4143L	CQA4153	CQA4153L
Remark	-	-	MPRII	-	MPRII

3-2 Dimensions

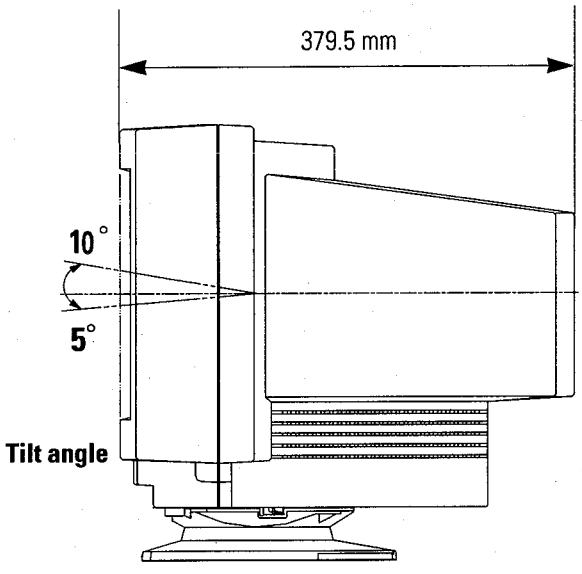
3-2-1 Front View



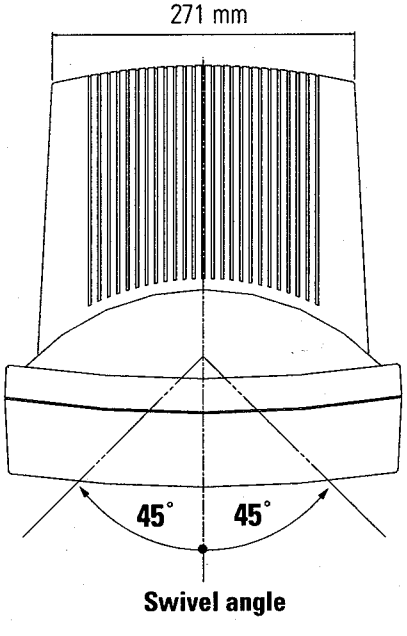
3-2-3 Rear View



3-2-2 Side View



3-2-4 Top View



3-3 Pin Assignments

Sync Type / Pin No.	9-Pin Signal Cable Connector (Figure 3-1)	15-Pin Signal Cable Connector (Figure 3-2)
	Separate	Separate
1	Red	Red
2	Green	Green
3	Blue	Blue
4	H-Sync	GND
5	V-Sync	GND
6	GND-R	GND-R
7	GND-G	GND-G
8	GND-B	GND-B
9	GND-Sync	NC
10	-	GND-Sync
11	-	GND
12	-	NC
13	-	H-Sync
14	-	V-Sync
15	-	NC

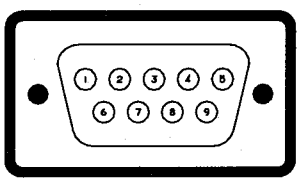


Figure 3-1. Female Type

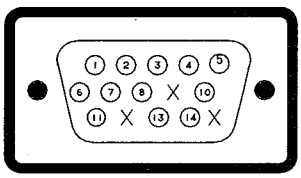


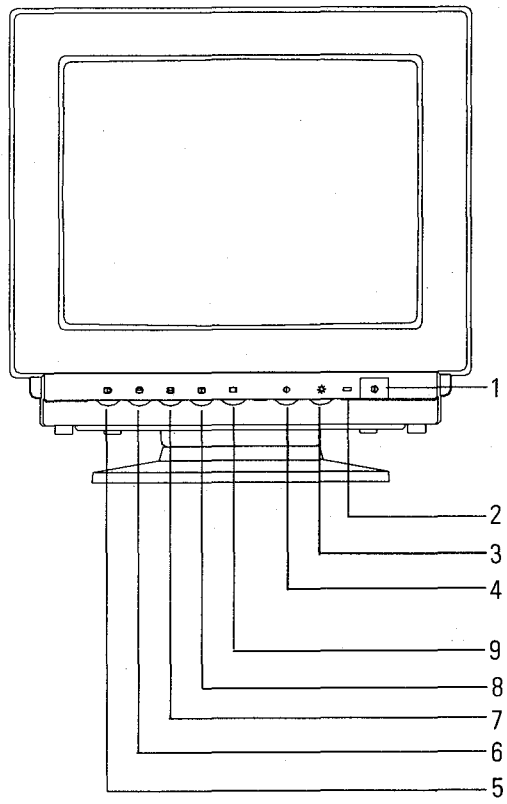
Figure 3-2. Female Type

Memo

4 User Controls

4-1 Front View and Controls

4-1-1. Front View



Note 1: When used with a computer equipped with DPMS (VESA), this monitor is EnergyStar compliant.

Note 2: The monitor automatically returns to the normal operation state when horizontal and vertical sync returns. This occurs when you move the mouse or press a key on the keyboard.

Table 4-1. Display Power Management Signaling (DPMS) Standard

State / Items	Normal Operation	Power saving function EPA/NUTEK		
		Suspend Mode		Power Off Mode
Horizontal Sync	Active	Inactive	Active	Inactive
Vertical Sync	Active	Active	Inactive	Inactive
Video	Active	Blanked	Blanked	Blanked
Power Indicator	Green	Orange		Orange, Green Blinking (1Sec interval)
Power Consumption/hr	70W	Less than 15W		Less than 8W

4-1-2 Front Control Panel

Location	Symbol	Description
1		Power Button (Push)
2		Power Indicator LED (Dual Color)
3		Brightness Control
4		Contrast Control
5		Horizontal Position Control
6		Vertical Position Control
7		Horizontal Size Control
8		Vertical Size Control
9		Side Pin Cushion Control

Memo

5 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the CQA41** Series monitors.

WARNING: These monitors contain electrostatically sensitive devices. Use caution when handling any components.

5-1 Disassembly

Caution: Disconnect the monitor from the power source before disassembling the monitor.

5-1-1 Cabinet Disassembly

1. With a pad underneath it, stand the monitor on its front with the screen facing downward and the base closest to you. Make sure nothing will damage the screen.
2. Working from the back of the monitor, remove the four screws.
3. Tilt the Rear Cover away to release the two tabs and pull it up and away from the monitor.
4. Disconnect all accessible connectors from the Main PCB:
   - Horizontal/Vertical DY
   - Degaussing Coil
   - CRT ground wires (2)
5. Using pinch-nose pliers or long-nose pliers, carefully disconnect the Anode cap from the CRT.

Caution: Do not touch the anode on the CRT.

6. Using a knife, cut through the silicon bond and lift of the Video PCB.
7. Using a flat-head screwdriver, pop the two tabs at the front end on the bottom of the front Cover Assembly and lift the Main PCB away from the front Cover Ass'y.
8. Lift the Degaussing Coil Assembly up and away from the CRT.
9. Remove the four corner screws at the lift the 14" color CRT up and away from the Front Cover Assembly. Do Not lift the CRT by the Neck.

Caution : If you will be returning this CRT to the monitor, be sure to place the CRT face down on a protective pad.

10. Remove the CRT Ground Ass'y starting with the corner having the spring.

5-1-1 (a) Removing the Stand Assembly

1. Slid the Stand Assembly towards the back of the cabinet to free the two tabs and lift the Top Stand up and away from the rear Cover.
2. Slide the Top Stand so that the Bottom Stand tab is at the front end of the slot.
3. Rotate the Top Stand so that the stopper snap is fully exposed.
4. From the underside of the Bottom Stand, use your thumb to pull the stopper snap down and rotate the Top Stand until the Bottom Stand tab is free in the slot. Pull the Top Stand and Bottom Stand apart.

5-1-2 Removing the Video PCB

1. Follow steps 1 through 6 in "Removing the Cabinet," above.
2. Remove all remaining connectors:
   - Signal input
   - Screen (1-pin)
   - Lift the cap on the CRT Socket and desolder the Focus Wire
   - Video connector assembly
   - G2 wire connector
   - Grounding terminal
3. Desolder the four tabs on the underside of the Video Shield.
4. Lift the Video PCB out of the Video Shield Case and place it on a flat, level surface which is protected from static electricity.

5-1-3 Removing the Main PCB

1. Follow steps 1 through 7 in Removing the Cabinet," above.
2. If you have not already done so, disconnect the Video PCB Assembly from the Main PCB.
3. Lift the Main PCB away from the Front Cover Ass'y.
4. Remove the Left and Right PCB Brackets.
5. Set the Main PCB on a smooth, level surface that is protected from static electricity.

5-2 Reassembly

With the CRT facing downward on a protective pad, use the steps that follow to reassemble the monitor.

5-2-1 Replacing the CRT

1. Loop the CRT Ground Ass'y around the back of the CRT and under the four corner metal tabs. Position the corner with the spring last.
2. With the Front Cover Assembly lying face down on a protective pad, position the CRT so that the corner metal tabs fit properly in the Front Cover Assembly.
3. Secure the CRT Ground Ass'y and CRT at the each of the four corners with the CRT screws.
5. Replace the Degaussing Coil Assembly and wrap the Coil with the plastic coated metal ties to hold the Coil in place.

5-2-2 Replacing the Video PCB

1. Place the Video PCB in the Video Shield Case and solder it in place so that it is secured by the six tabs.
7. Reconnect the connectors:
    - Signal input
    - Screen (1-pin)
    - Lift the cap on the CRT Socket and des older the Focus Wire
    - Video connector assembly
    - G2 wire connector
    - Grounding terminal

5-2-3 Replacing the Main PCB

1. Replace the Left and Right PCB Brackets.
2. Align the Main PCB Assembly in the guide slot along the left and right side in the front Cover Assembly.
3. Carefully push the Main PCB Ass'y until it is fully inserted and you hear click as the tabs engage on the Front Cover Ass'y.
4. Reconnect the following connectors:
    - Horizontal/Vertical DY
    - Degaussing Coil
    - CRT ground wires (2)
    - Anode Cap

5-2-4 Cabinet Reassembly

2. If you have not already done so, re-install the CRT following the directions given in "5-2-1 Replacing the CRT."
3. If you have not already done so, re-install the Video PCB following the directions given in "5-2-2 Replacing the Video PCB."
4. If you have not already done so, re-install the Main PCB following the directions given in "5-2-3 Replacing the Main PCB."
5. Position the Rear Cover making sure the tabs along the front edge are properly snapped in place. Replace the four screws.
6. Set the monitor on its Base and make sure that the CRT Screen was not scratched or otherwise damaged.

6 Alignments and Adjustments

This section of the service manual explains how to control the raster size, position, pincushion, and make convergency and color adjustments.

6-1 Adjustment Conditions

Direction

When servicing, always face the monitor toward the East and, whenever possible, use magnetic field isolation such as a helmholtz field around the monitor.

Caution: Other electrical equipment may cause external magnetic fields.

During servicing, use an external degaussing coil to limit magnetic build up. If an external degaussing coil is not available, use the internal degaussing circuit, but not more than once per minute.

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing in a northerly direction, face the monitor eastward again and readjust the monitor to the smallest error possible within a reasonable time limit. Test the unit again in all directions. If the monitor again fails to meet specifications in a non-easterly direction, contact your region's main service center for possible CRT replacement.

Testing and Burn-in Mode

For testing and burn-in, remove the signal cable from the monitor. Power on the monitor and warm it up. Use the burn-in mode to age the monitor.

Power Supply Voltage

AC 90-264 Volt (60/50 Hz ± 3 Hz).

High Voltage Control

Adjust VR407 to 26 kV ± 0.2 kV.

Warm-Up Time

The display must be on for 30 minutes before starting alignment. Warm-up time is especially critical in color temperature and white balance adjustments.

Signal

Video analog 0.714 Vp-p positive at 75 ohm terminated.

Sync: Separate
(TTL level negative/positive).

Scanning Frequency

Horizontal/Vertical
31.47 kHz/70 Hz, 31.47 kHz/60 Hz,
35.52 kHz/87 Hz, 37.86 kHz/72.8 Hz,
35.16 kHz/56 Hz, 37.88 kHz/60.3 Hz,
37.50 kHz/75 Hz

6-2 Prepare Main PCB for Adjustment

+B 195V Line Adjustment

No beam, Contrast: Minimum,
Brightness: Minimum.

Adjust VR601 to DC 150 V ± 1 V at T402 heat sink and GND.

High Voltage Adjustment

No beam, Contrast: Minimum,

Brightness: Minimum
Adjust VR407 to 26 kV ± 0.2 kV.

Center Raster

Adjust VR403 (H-hold) for the horizontal frequency equal to 31.5 ± 0.2 kHz.

6-3 Display Control Adjustments

Unless otherwise specified, adjust the EXT-VR:

Contrast : Max. (Fully clockwise)
Brightness : Max. (Fully clockwise)

6-3-1 Centering

Centering means to position the center point of the display in the middle of the display area. Horizontal size and position and vertical size and position control the centering of the display. Adjust the horizontal size and vertical size to their optimal settings: 255 mm (H) x 191 mm (V) Adjust the horizontal position and vertical position to ≤4.0 mm of the center point of the screen.

$|A - B| \leq 4.0$ mm.
$|C - D| \leq 4.0$ mm.

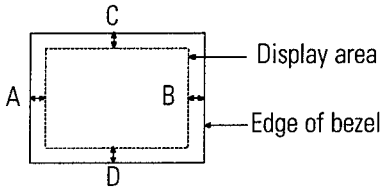


Figure 6-1. Centering

6-3-2 Horizontal Size Adjustment

Conditions

Scanning frequency: 37.8 kHz/60.3 Hz (800 x 600)
Display image: Crosshatch pattern
Brightness: Maximum
Contrast: Maximum
Adjust VR404 (H-size) to 255 ± 5mm.

6-3-3 Vertical Size Adjustment

Conditions

Scanning frequency: 37.8 kHz/60.3 Hz (800 x 600)
Display image: Crosshatch pattern
Brightness: Maximum
Contrast: Maximum
Adjust VR401 (V-size) to 191 ± 5mm.

6-3-4 Horizontal/Vertical Position Adjustment

Conditions

Scanning frequency: 37.8 kHz/60.3 Hz (800 x 600)
Display image: Crosshatch pattern
Adjust VR405 (H-shift) and VR301 (V-shift) to center the screen position.
Note : VR405 (H-shift), VR301 (V-shift), VR404 (H-size), VR401 (V-size), VR402 (Side-pin) are external controls. They are located along the lower edge of the front bezel.

6-3-5 Side Pincushion Adjustment

Conditions

Scanning frequency: 37.8 kHz/60.3 Hz (800 x 600)
Display image: Crosshatch pattern
Adjust VR402 (S-pin) to compensate for East/West distortion.

$|C1| - |C2| \leq 2$ mm
$|D1| - |D2| \leq 2$ mm

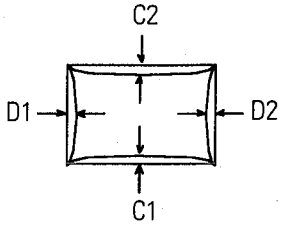


Figure 6-2. Pincushion

6-3-6 CRT Tilt Adjustment

Mechanical Adjustment:

Reassemble the CRT with fastening screws so that the measurements A and B are equal and the C and D measurements are equal.
If you are unable to correct the tilt, contact the regional service center for CRT replacement.

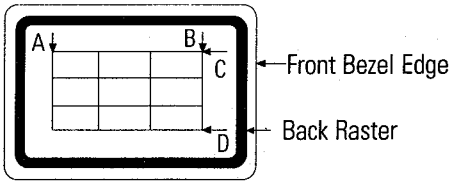


Figure 6-3. CRT Tilt Adjustment

6-4 Luminance Uniformity

Luminance uniformity means that the luminance at the position of the lowest brightness must be more than 75% of the luminance at the area with the highest brightness. Luminance is considered uniform only if the ratio of lowest to highest brightness is not less than 7.5:10.

Table 6-1. Computing Luminance Uniformity

Value	75 % (Min) Variation = $\frac{C}{A}$ x 100
Conditions	Display Image : White flat field. Luminance : Brightness cut off, Contrast max. A : Luminance at position of highest brightness. C : Luminance at position of lowest brightness.

6-5 White Balance Adjustment

Conditions

Measurement instrument: Color analyzer
Scanning frequency: 37.5 kHz/75 Hz (640x480)
Display image: 60 mm square white pattern
Brightness: VR502, maximum

1. Adjust VR102R (R-BIAS) and VR102B (B-BIAS) so that the back raster color appears white to the unaided eye.
2. Set the brightness control (VR502) to the mechanical center position and the contrast control (VR501) to the maximum position.
3. Change the video signal to the 60mm square green pattern of the 37.5kHz/75kHz.
4. Adjust the VR101G (G-GAIN) so that the luminance of the green square is 40ft-L±2ft-L.
5. Change the video signal to the full white pattern of the 37.5kHz/75kHz.
6. Adjust the VR101R (R-GAIN) and VR101B (B-GAIN) to make the display color white. (X=0.283 ± 0.02, Y=0.298 ± 0.02)
7. Adjust the contrast control (VR501) so that the luminance is 3ft-L.
8. Adjust slightly VR102R (R-BIAS) and VR102B (B-BIAS) for the display color to be white.
9. Check the color coordinates at 20ft-L luminance. If there is some error, adjust the VR101R
10. Turn the contrast and the brightness controls fully clockwise.
11. Adjust the focus control of the FBT to display the sharpest image possible. (R-GAIN) and VR101B (B-GAIN) for the display color to be white.
12. Recheck the color coordinates at 3ft-L luminance and check the white color with rotating the contrast control (VR501). If there is some error, retry the adjustment from (2).
13. Recheck the back raster when signal cable is disconnected.
    The luminance is between 3.5ft-L and 15ft-L

6-6 Focus Adjustment

Conditions

Scanning frequency: 35.5 kHz/59.9 Hz (1024 x 768)
Display image: "H" character pattern
Brightness: Maximum
Contrast: Maximum

1. Adjust the focus control of the FBT to display the sharpest image possible.
2. Use locktite to seal the focus control in position.

6-7 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from CRT surface.

Note: Color purity adjustments should only be attempted by qualified personnel.

Conditions

Direction : Monitor facing east.
Display image : White flat field.
Luminance : Cutoff point at the center of display area.

6-8 Convergence Adjustments

Misconvergence occurs when one or more of the electron beams in a multi beam CRT fail to meet the other beams at a specified point.

Table 6-1. Misconvergence Tolerance

Position	Error in (mm)	CRT Dot Pitch	Model No.
Center (A)	0.3	0.28	CQA 4147 CQA 4157
	0.3	0.39	CQA 4143 CQA 4153
Corner (B)	0.4	0.28	CQA 4147 CQA 4157
	0.4	0.39	CQA 4143 CQA 4153

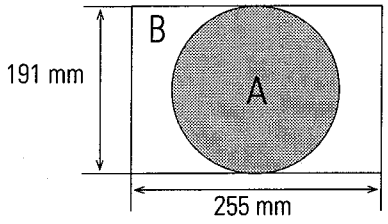
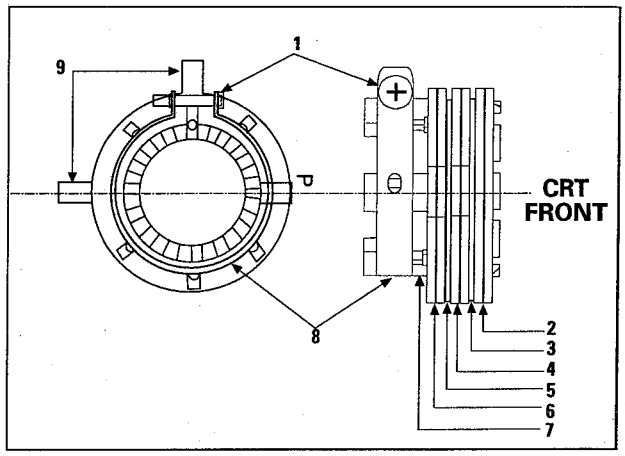


Figure 6-4. Convergence Measurement Areas



SAMSUNG SDD CRT		
1: Setup Bolt	2: 2-Pole Magnet	3: Spacer
4: 4-Pole Magnet	5: Spacer	6: 6-Pole Magnet
7: Holder	8: Band	9: Tabs

Figure 6-5. Magnet Configuration

Red and Blue Alignment (4-pole magnet movement)

Red and Blue and Green Alignment (6-pole magnet movement)

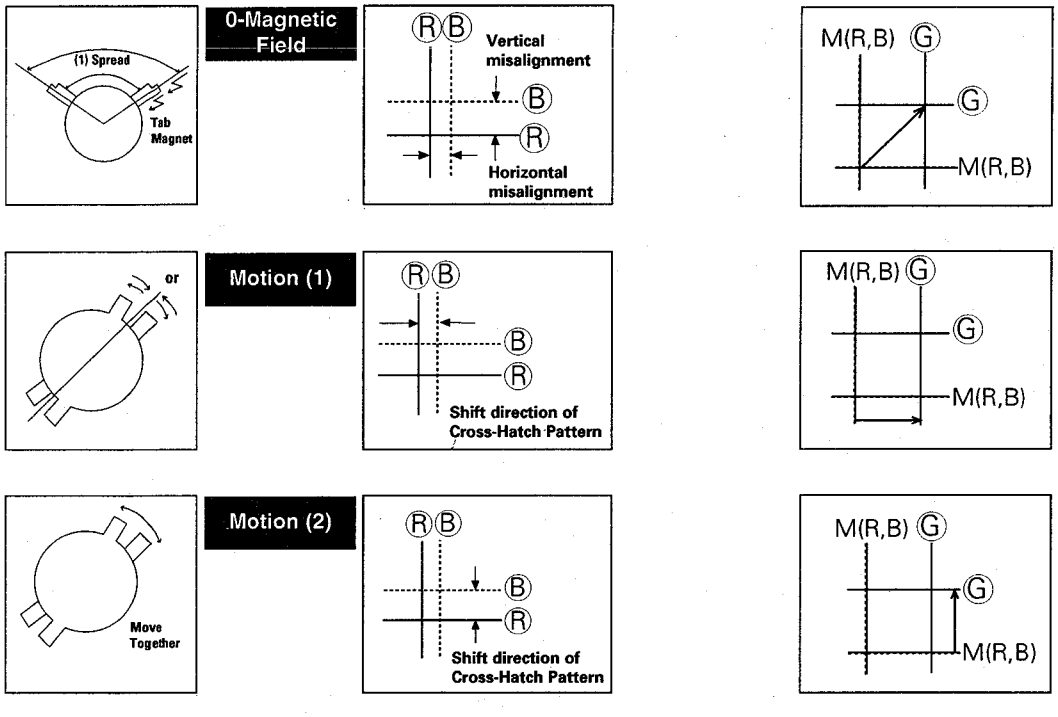


Figure 6-6. Magnet Movements

6-8-1 Static (Center) Convergence

Static convergence in volves the alignment of the red, blue and green lines in the center area of the display.
See "Dynamic Convergence" for alignment of the color fields around the edges of the display.

Condition
Direction : Monitor facing east
Warm-up : 30 minutes
Display image : Crosshatch pattern
Tolerances : See Table 6-1

As shown in Figures 6-5, CRTs used in these monitors all have the same magnet configuration as shown in table 6-2 below.

Table 6-2. Magnet Configurations

CRT Manufacturer	Magnet Order from Front of CRT
SDD CRTs	two-pole, four-pole six-pole

Use the following steps to correct any static misconvergence:

1. Locate the pair of four-pole magnet rings.
2. Unlock the rings and rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue lines.
3. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue lines.
4. After completing the red and blue center convergence adjustment, locate the pair of 6-pole magnet rings.
5. Rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue (magenta) and green lines.
6. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Don't rotate the 2-pole magnet because it is for purity adjustments.
7. Mark the correct position for the magnets and apply a small line of glue to hold the magnets in place. Lock the rings in place.

6-8-2 Dynamic (Edge) Convergence

Use the following procedure to correct minor dynamic (edge) misconvergence. If, after using this procedure, dynamic misconvergence is still greater than the 0.4 mm tolerance around the periphery of the display area, replace the CRT.

1. Make sure the display is not affected by external magnetic fields.
2. Make sure the static convergence is properly adjusted.
3. Strategically place small magnetic strips on the back of the CRT to correct the misconvergence. Be careful not to remove the paper protecting the adhesive on the magnetic strip until you are satisfied with their placement and the dynamic convergence.
4. When you are satisfied with the convergence around the edge of the CRT, permanently glue the magnets to the back of the CRT.

Table 6-3. Magnetic Strips

Description	Size	Code Number
Magnet Sheet	5 mm x 80 mm	937 319004CA
Magnet Sheet	10 mm x 80 mm	937 319004AA

Warning

Do not remove the factory installed wedges. These wedges were installed by the CRT manufacturer and are properly placed for this CRT. Removal may result in damage to the CRT.

6-8-3 Bow Convergence Adjustment

Conditions

Direction: Monitor Facing East.
Display Image: Crosshatach pattern mixed with RGB colors.

Bow convergence adjustments are not available for any of the CRTs used in the CQA** Series monitors. While all the CRTs have bow convergence magnets, they are sealed in the CRT factory and are not user or service technician adjustable. Do not touch these magnets (see Figure 6-5). If color convergence bow adjustment is out of alignment, replace the CRT.

Bow misconvergence should not exceed the values listed in Table 6-1: Misconvergence Tolerances.

6-8-4 Balance Convergence Adjustments

Balance Convergence involves the alignment of the red and blue lines when they are misaligned at one end more so than at the other (X). The deflection yoke holds the balance coils which can correct balance misconvergences.

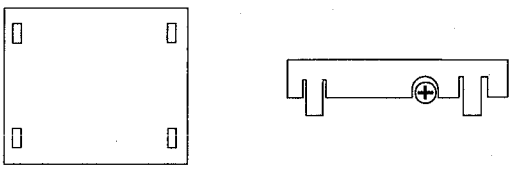


Figure 6-7. Saddle/Toroidal Deflection Coil

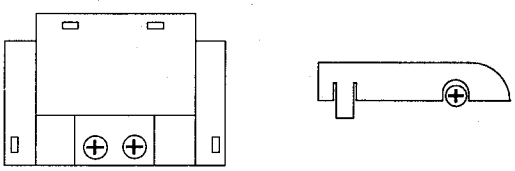


Figure 6-8. Saddle/Saddle Deflection Coil

6-8-4 (a) Horizontal Line Red and Blue Balance Convergence

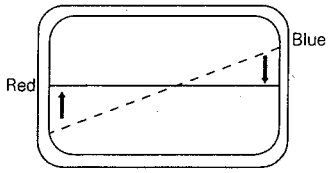


Figure 6-9. Horizontal Line Balance Misconvergence

Use a #0 hexdriver at the Horizontal Balance Coil (Xv). Turning the VR to the right raises the right end of the blue line and lowers the left end. Turning the VR to the left lowers the right end of the blue line and raises the left end.

6-8-4 (b) Vertical Red and Blue Balance Convergence

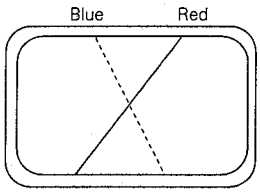


Figure 6-10. Vertical Line Balance Misconvergence

This adjustment is available only on Saddle/ Saddle DYs (see Figure 6-8). Use a #0 phillips screwdriver at the YH variable resistor. Turning the VR to the left tilts the blue line to the right. Turning it to the right tilts the blue line to the left.

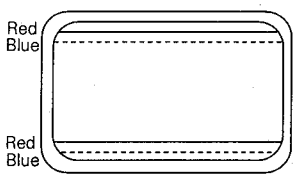
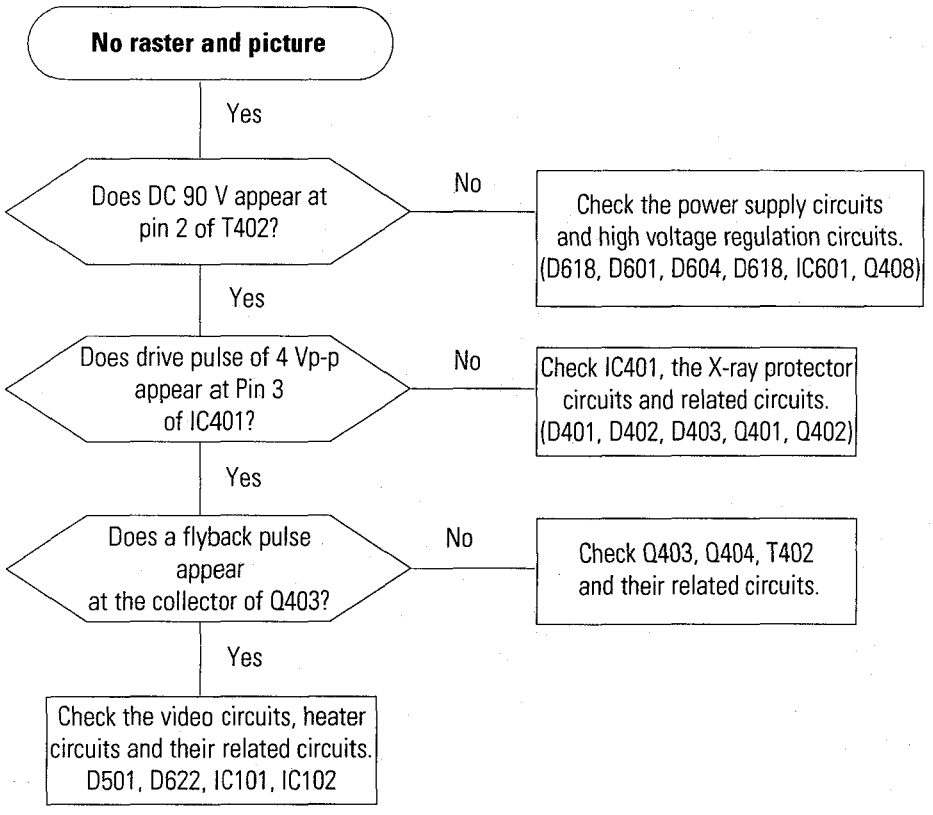


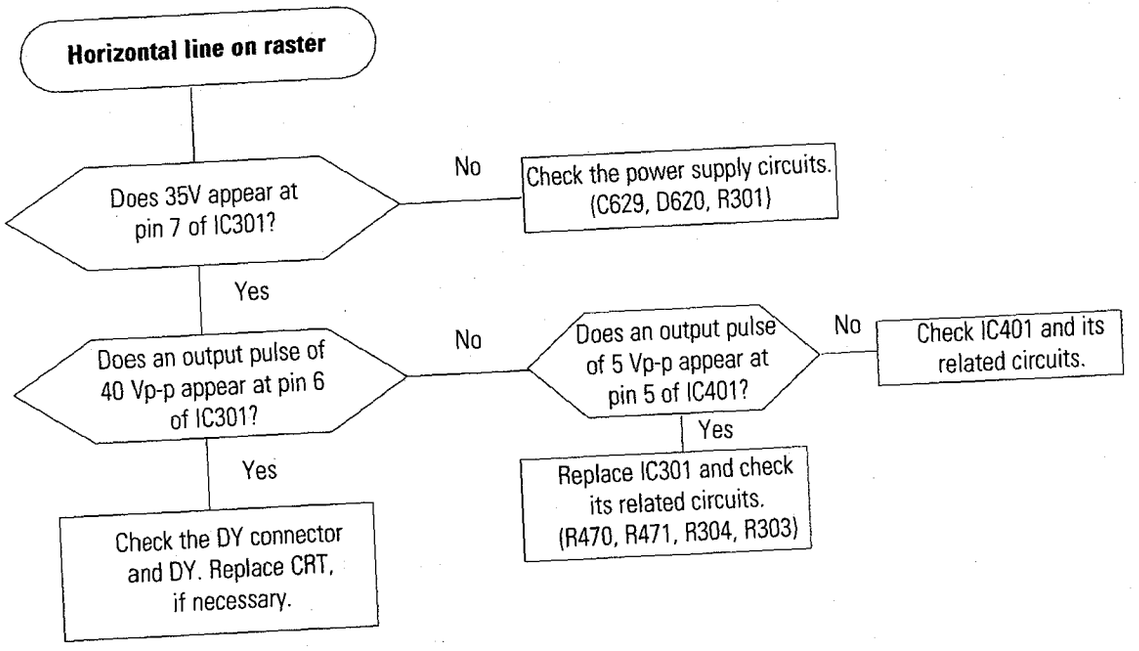
Figure 6-11. Upper and Lower Balance Misconvergence

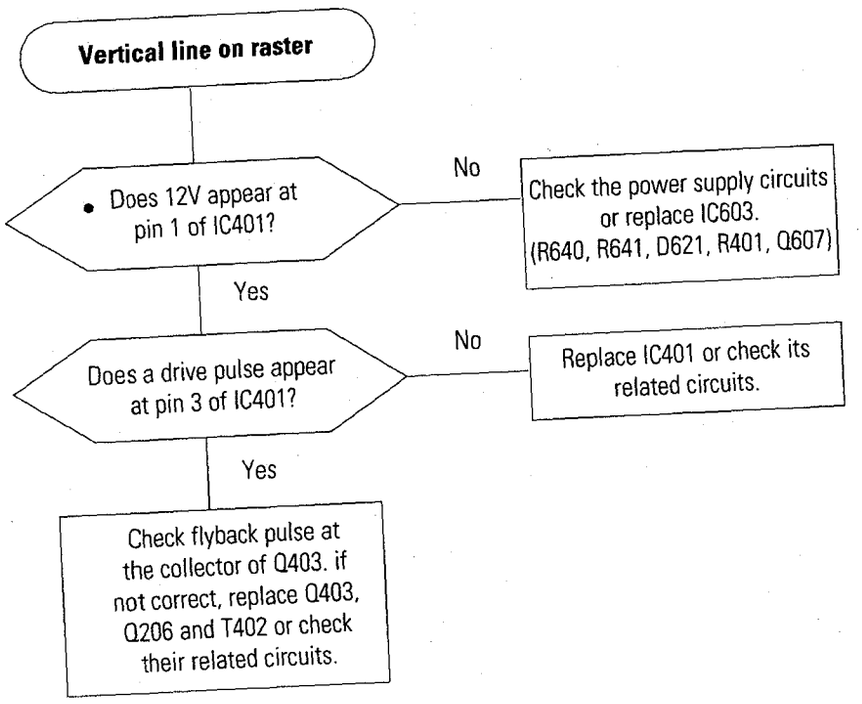
This adjustment is available only on Saddle/ Saddle DYs (see Figure 6-8). Use a #0 phillips screwdriver at the YV variable resistor. Turning the VR to the left moves the blue line at the top upward and at the bottom, the line moves downward. Turning it to the right moves the blue line at the top downward and at the bottom, the line moves upward.

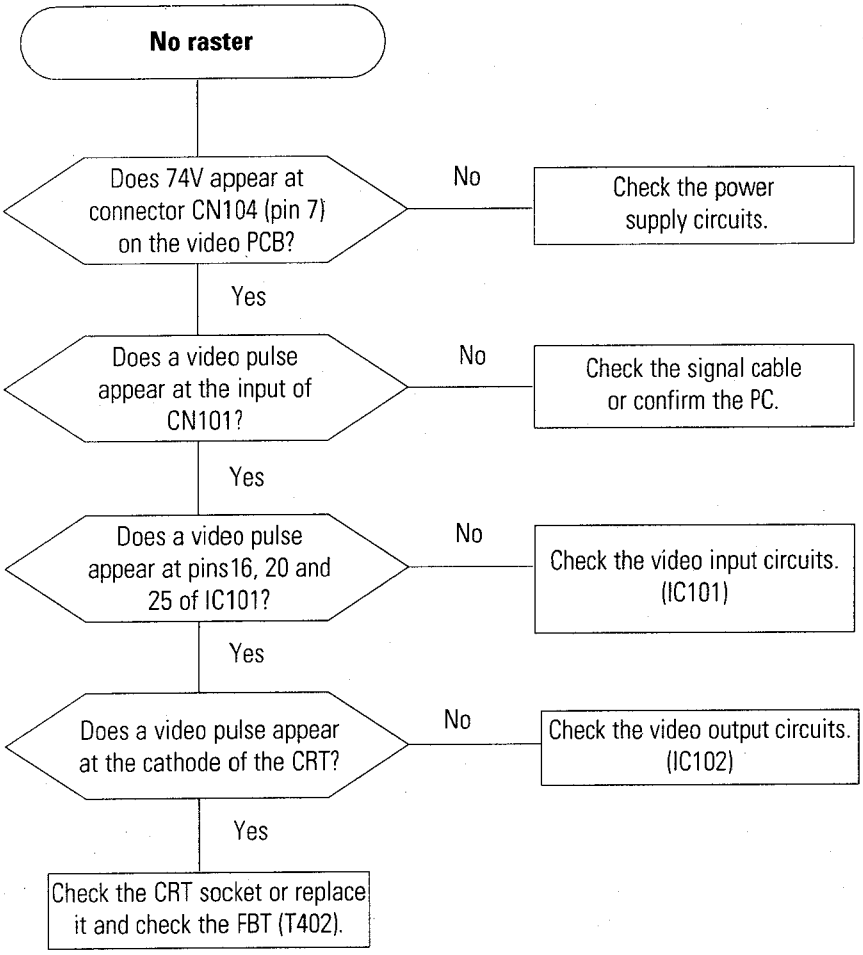
7 Troubleshooting

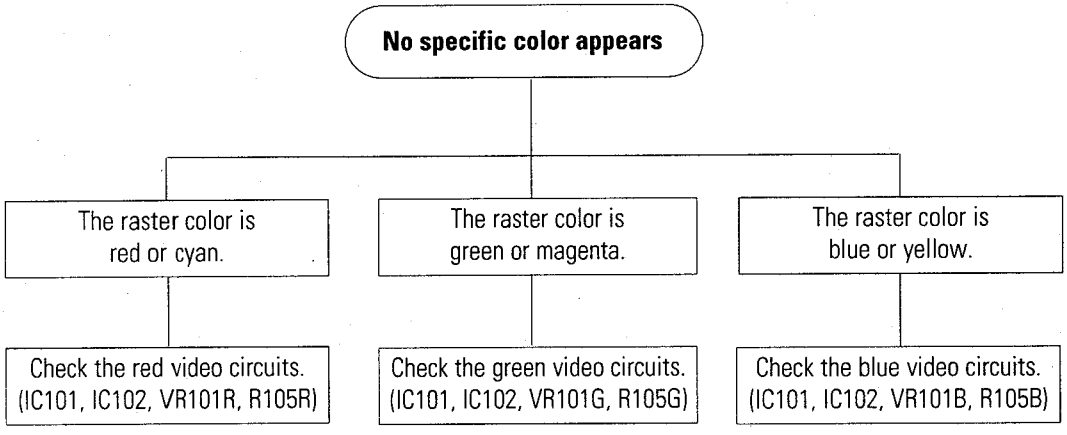
Notes: 1. If picture does not appear, fully rotate the brightness and contrast controls clockwise before inspection.
2. Check the following circuits:
   - No raster appears: Power circuit, horizontal output circuit, H/V control circuit and H/V output circuit.
   - High voltage develops but no raster appears: Video output circuits.
   - High voltage does not develop: Horizontal output circuits.

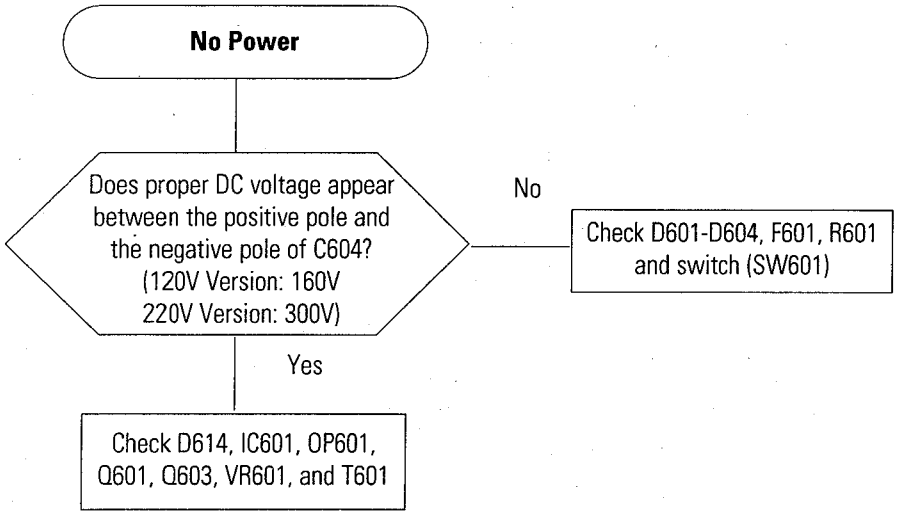

No raster and picture
Yes
Does DC 90 V appear at pin 2 of T402?
No
Check the power supply circuits and high voltage regulation circuits. (D618, D601, D604, D618, IC601, Q408)
Yes
Does drive pulse of 4 Vp-p appear at Pin 3 of IC401?
No
Check IC401, the X-ray protector circuits and related circuits. (D401, D402, D403, Q401, Q402)
Yes
Does a flyback pulse appear at the collector of Q403?
No
Check Q403, Q404, T402 and their related circuits.
Yes
Check the video circuits, heater circuits and their related circuits. D501, D622, IC101, IC102

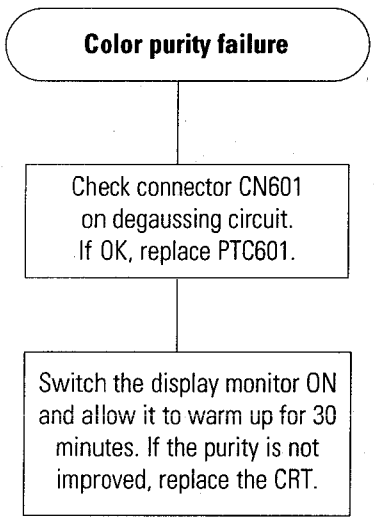

Horizontal line on raster
Does 35V appear at pin 7 of IC301?
No
Check the power supply circuits. (C629, D620, R301)
Yes
Does an output pulse of 40 Vp-p appear at pin 6 of IC301?
No
Does an output pulse of 5 Vp-p appear at pin 5 of IC401?
No
Check IC401 and its related circuits.
Yes
Replace IC301 and check its related circuits. (R470, R471, R304, R303)
Yes
Check the DY connector and DY. Replace CRT, if necessary.


Vertical line on raster
Does 12V appear at pin 1 of IC401?
No
Check the power supply circuits or replace IC603. (R640, R641, D621, R401, Q607)
Yes
Does a drive pulse appear at pin 3 of IC401?
No
Replace IC401 or check its related circuits.
Yes
Check flyback pulse at the collector of Q403. if not correct, replace Q403, Q206 and T402 or check their related circuits.

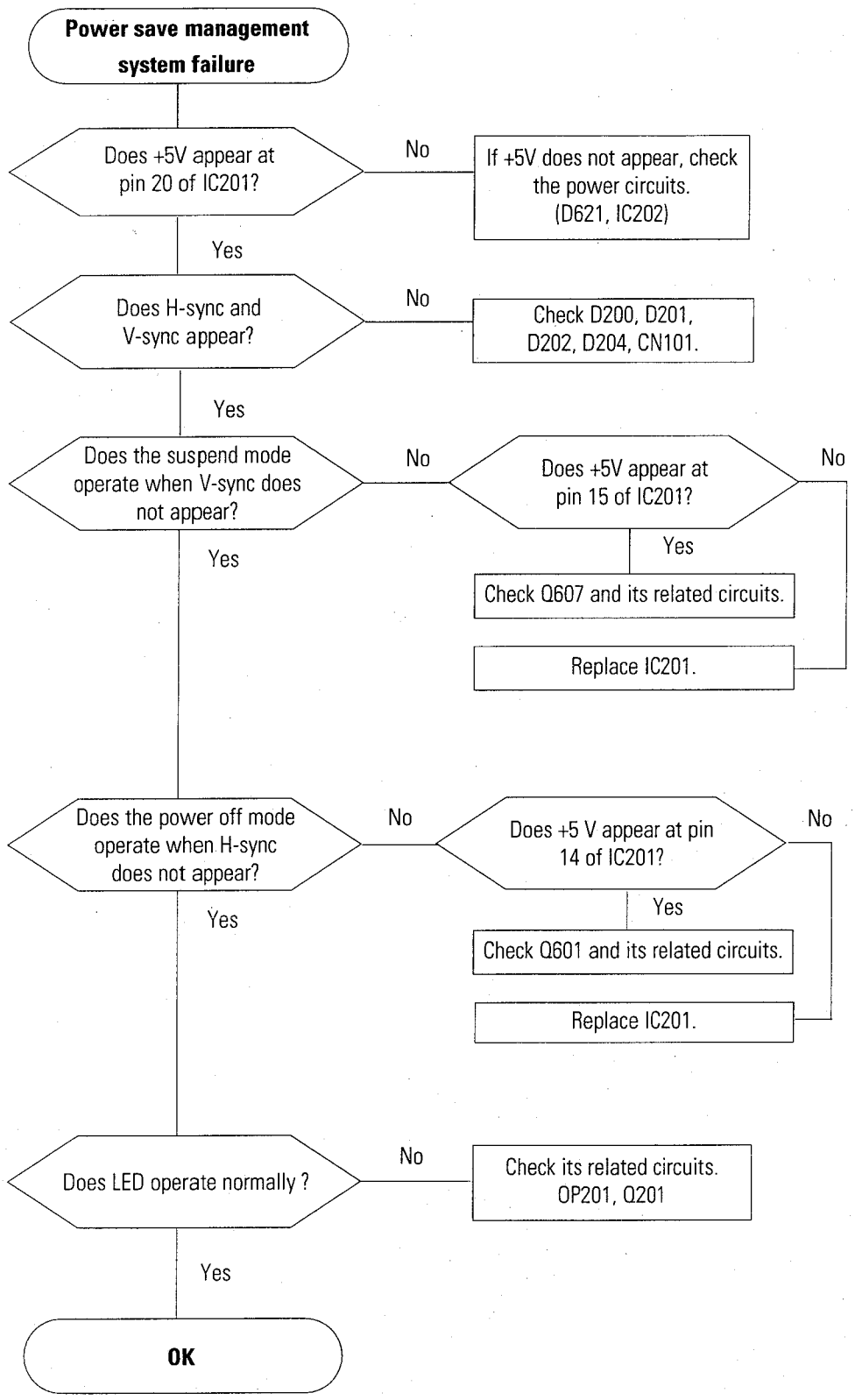

No raster
Does 74V appear at connector CN104 (pin 7) on the video PCB?
No
Check the power supply circuits.
Yes
Does a video pulse appear at the input of CN101?
No
Check the signal cable or confirm the PC.
Yes
Does a video pulse appear at pins16, 20 and 25 of IC101?
No
Check the video input circuits. (IC101)
Yes
Does a video pulse appear at the cathode of the CRT?
No
Check the video output circuits. (IC102)
Yes
Check the CRT socket or replace it and check the FBT (T402).


No specific color appears
The raster color is red or cyan.
The raster color is green or magenta.
The raster color is blue or yellow.
Check the red video circuits. (IC101, IC102, VR101R, R105R)
Check the green video circuits. (IC101, IC102, VR101G, R105G)
Check the blue video circuits. (IC101, IC102, VR101B, R105B)


No Power
Does proper DC voltage appear between the positive pole and the negative pole of C604? (120V Version: 160V 220V Version: 300V)
No
Check D601-D604, F601, R601 and switch (SW601)
Yes
Check D614, IC601, OP601, Q601, Q603, VR601, and T601

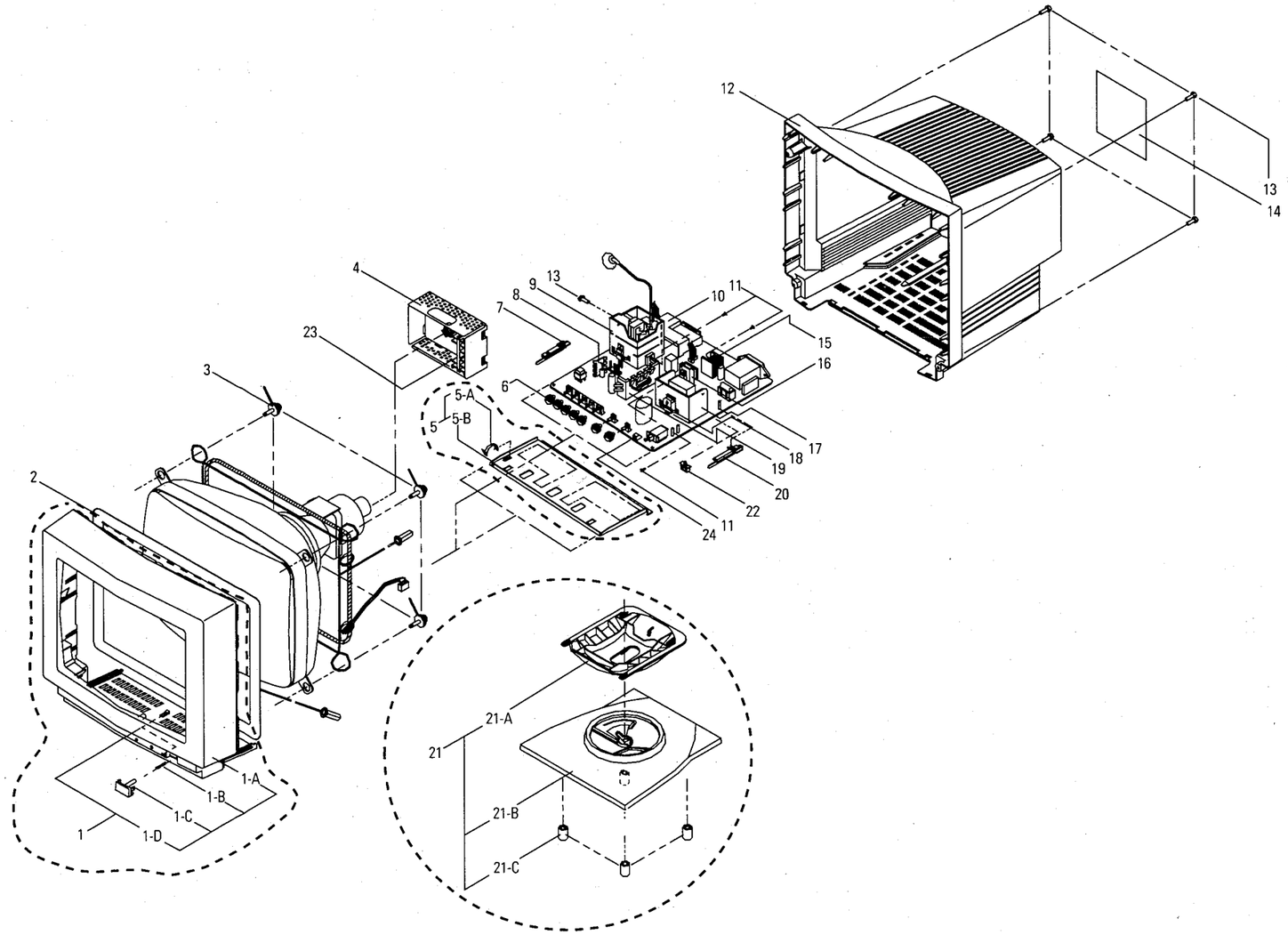

Color purity failure
Check connector CN601 on degaussing circuit. If OK, replace PTC601.
Switch the display monitor ON and allow it to warm up for 30 minutes. If the purity is not improved, replace the CRT.

NOTE : If color purity is not normal, manually degauss the monitor using an external degaussing coil before inspection.


Power save management system failure
Does +5V appear at pin 20 of IC201?
No
If +5V does not appear, check the power circuits. (D621, IC202)
Yes
Does H-sync and V-sync appear?
No
Check D200, D201, D202, D204, CN101.
Yes
Does the suspend mode operate when V-sync does not appear?
No
Does +5V appear at pin 15 of IC201?
No
Yes
Check Q607 and its related circuits.
Replace IC201.
Yes
Does the power off mode operate when H-sync does not appear?
No
Does +5 V appear at pin 14 of IC201?
No
Yes
Check Q601 and its related circuits.
Replace IC201.
Yes
Does LED operate normally ?
No
Check its related circuits. OP201, Q201
Yes
OK

Memo

8 Exploded View and Parts List

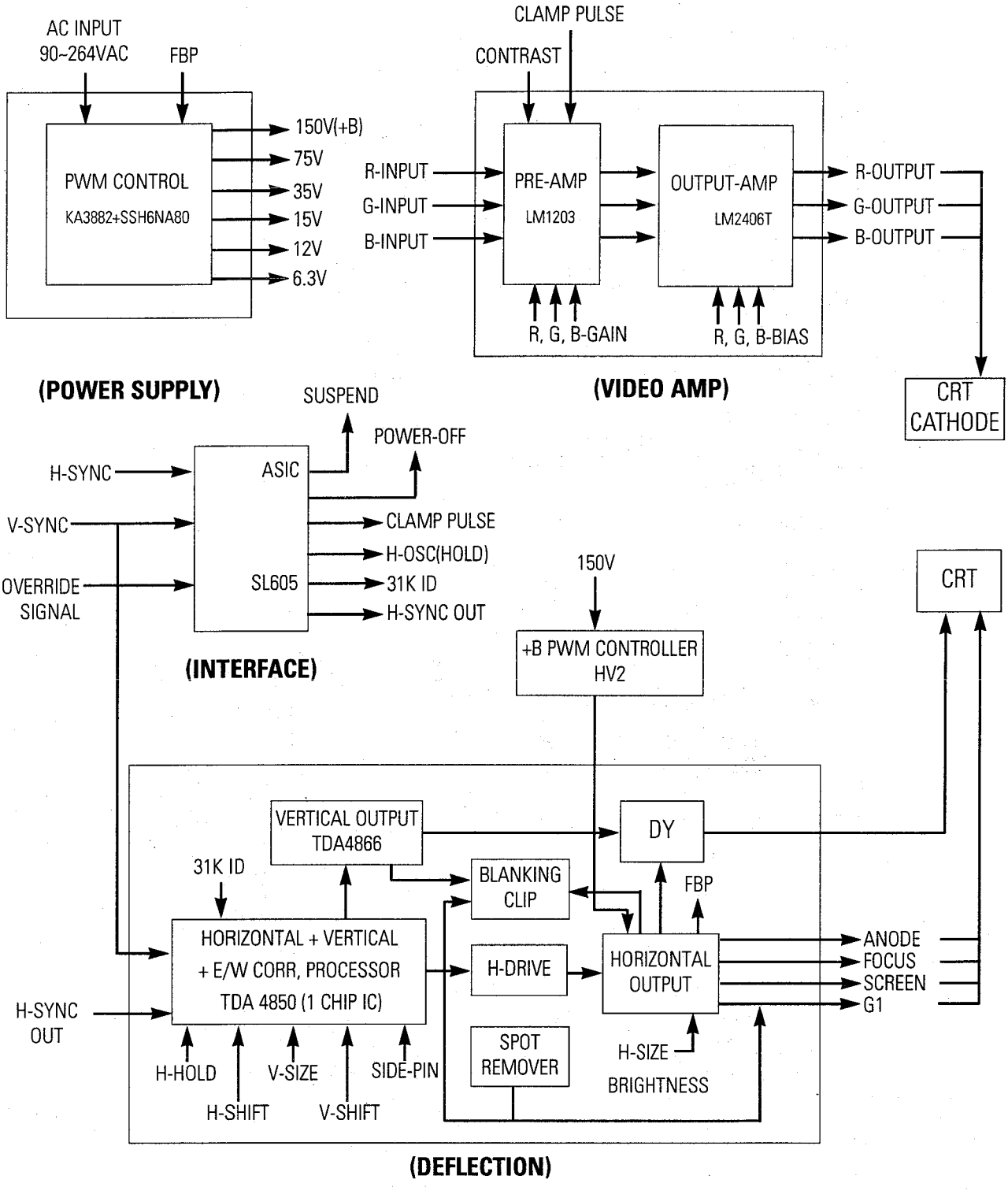


⚠ : Caution ● : Specialty part for this monitor only

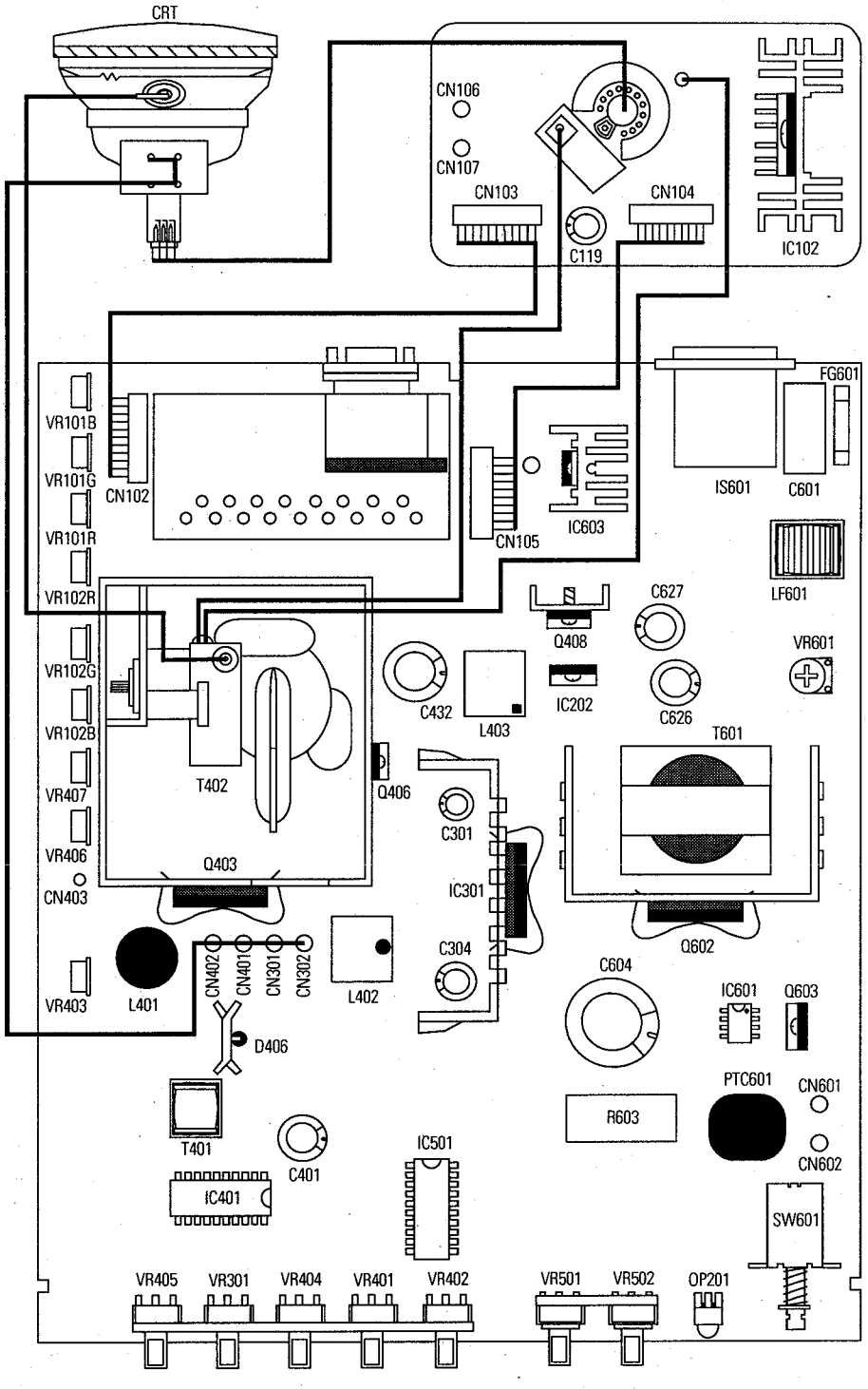
No.	Description	Code No.	Specification	Q'TY	Remark
1	COVER/FRONT-ASSY	BH75-10027A	CQA4147	1	●
	COVER/FRONT-ASSY	BH75-10072B	CQA4157	1	●
1-A	COVER-FRONT	BH72-60046A	ABS VO IV01, CQA4147	1	●
	COVER-FRONT	BH72-60054A	ABS VO IV01, CQA4157	1	●
1-B	SPRING-COIL	831 522013AA	SUS-302 WPA, CQA4147/4157	1	
1-C	KNOB-POWER	BH64-10024A	ABS VO IV01, CQA4147	1	●
	KNOB-POWER	BH64-10026A	ABS VO IV01, CQA4157	1	●
1-D	LENS-LED	BH67-10007A	ACRYL CLEAR, CQA4147	1	●
	LENS-LED	BH67-10008A	ACRYL CLEAR, CQA4157	1	●
2	SHIELD/F-ASSY	831 522013AA	CQA4147, CQA4157	1	●
3	TAPPING,CRT	6006-000001	BH,+,1,M5,L30,ZPC3,W/W	4	
4	SHIELD-CRT,PCB	BH70-10009A	SPTE TO 3	1	●
5	B/CHASSIS-ASSY	BH75-10047A	CQA4147, CQA4157	1	●
5-A	BRKT-BOTTOM	BH70-10010A	SECC-1 TI 0	1	●
5-B	SPRING-PLATE	BH61-70002A	SUS-401 1/2H T0.2	1	●
6	KNOB-VR	BH64-10023A	ABS VO IV01	7	●
7	BRKT/G-PCB (L)	BH72-60052A	ABS VO IV01	1	●
8	H/SINK-DIODE	BH62-30009A	BS TI 0 TIN COATING	1	●
9	H/SINK-FBT	831 514510AA	A1050S HI4 TI 0	1	
10	S/MAIN-PCB	815 464124AA	SPTE TO 3	1	
11	SCREW-TAPTITE	847 502005AA	BH,+,1,M3,L10,ZPC3,W/W	4	
12	COVER-REAR	BH72-60047A	ABS VO IV01	1	●
13	SCREW-TAPTITE	847 501007FC	B,BH,+,M4,L16,ZPC3,SWCH	5	
14	LABEL-RATING	BH68-30025A	POLYESTER TO 0173	1	●
15	H/SINK-IC (317)	6203-000001	A6063 EXTR H35	1	●
16	H/SINK-TR (408)	BH62-30014A	SPC-1 TI 0	1	
17	H/SINK-POWER	831 513523EA	A1250S HI4 T2 0	1	●
18	SPRING-TR	813 468062AC	SUS-304 1/2H 0.17/TO.5	3	
19	H/SINK-IC (4866)	BH62-30010A	A1050S HI4 T3.0	1	●
20	BRKT/G-PCB (R)	BH72-60053A	ABS VO IV01	1	●
21	STAND-ASSY	BH75-10031A	CQA4147, CQA4157	1	●
21-A	STAND-TOP	BH72-60048A	ABS VO IV01	1	●
21-B	STAND-BASE	BH72-60049A	ABS VO IV01	1	●
21-C	RUBBER-FOOT	821 463092AA	NEOPRENE VO GRAY	4	
22	PCB-MOUNT	857 150054AB	NYLON 66	2	
23	H/SINK-IC (102)	6203-000008	A6063 EXTR H35	1	
24	HOLDER-LED	BH67-3001A	ABS VO IV01	1	●

9 Servicing Diagrams

9-1 Block Diagram



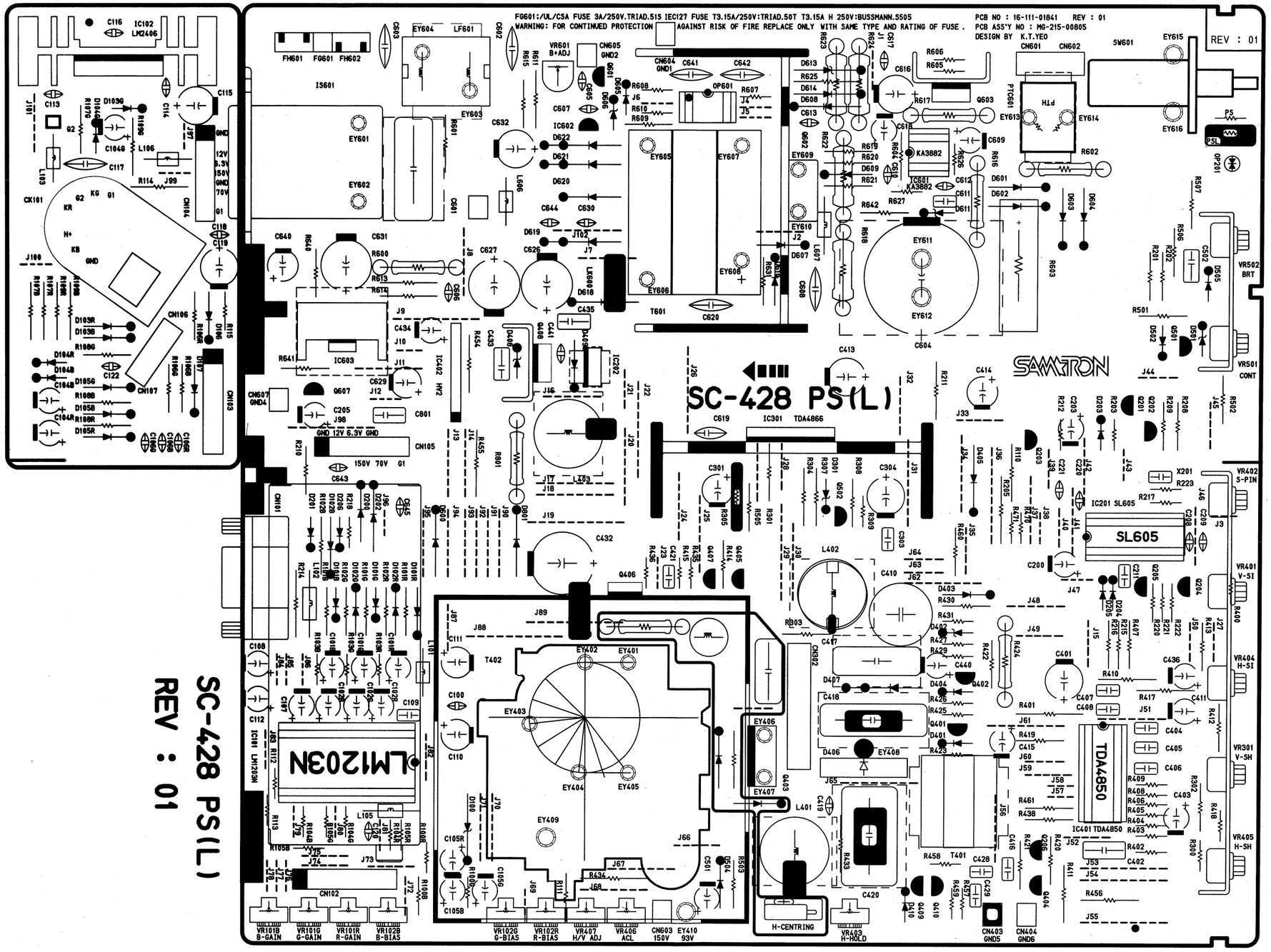
9-2 Wiring Diagram



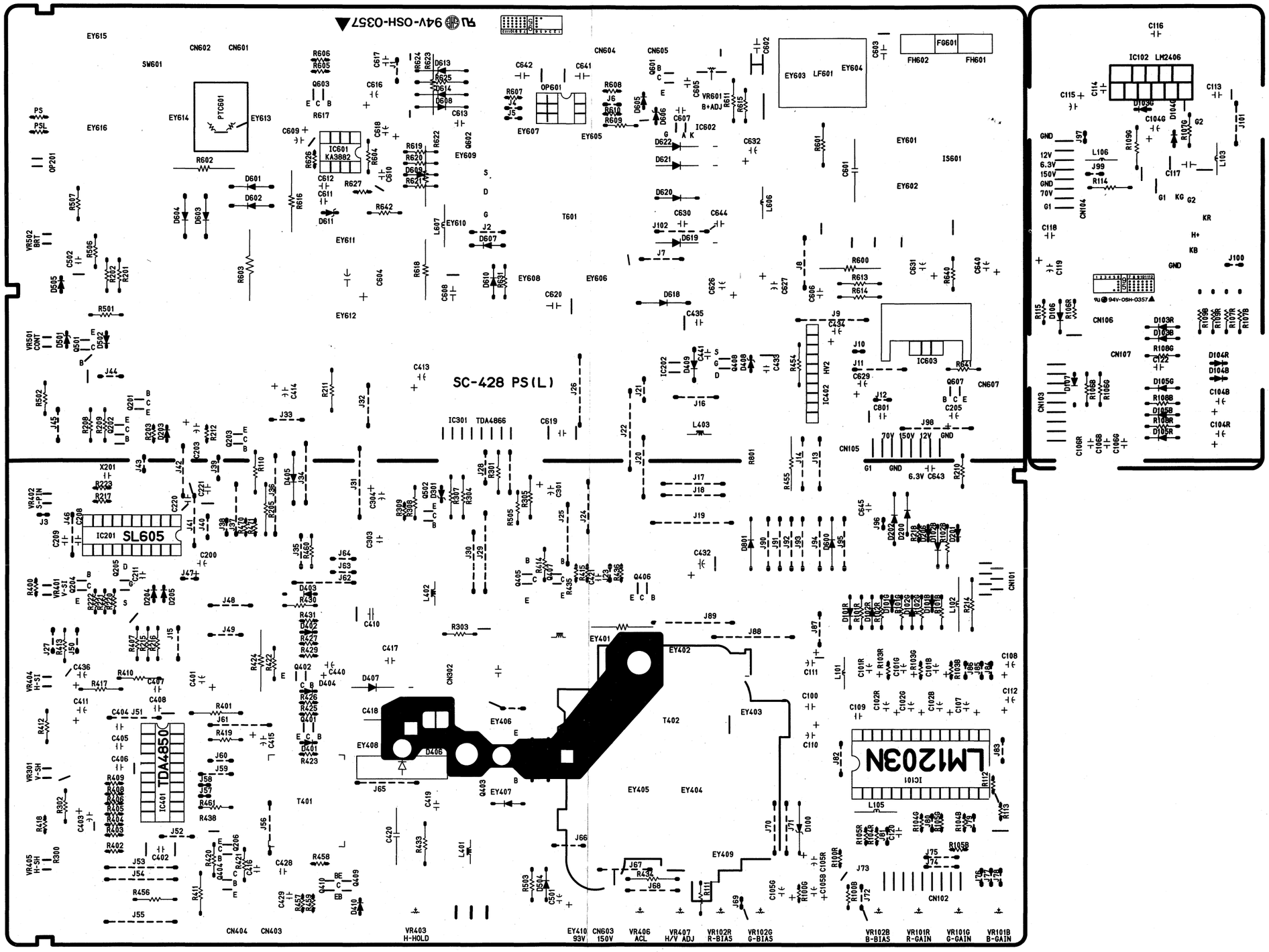
9-3 PCB Layout and Electrical Parts List

9-3-1 PCB Layout

Main and CRT Socket Top View



Main and CRT Socket Bottom View


SC-428 PS(L)
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TDA4850
LM1203N
94V-OSH-0357
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SW601
PTC601
IC601 KA3882
IC301 TDA4866
IC202
IC603
IC402 HV2
IC102 LM2406
IC201
IC401
IC101
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T401
T402
IS601
L607
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L103
OP601
OP201
VR601 B+ADJ
VR602 BRT
VR501 CONT
VR404 H-SI
VR301 V-SH
VR405 H-SH
VR402 S-PIN
VR403 H-HOLD
VR406 ACL
VR407 H/V ADJ
VR102R R-BIAS
VR102G G-BIAS
VR102B B-BIAS
VR101R R-GAIN
VR101G G-GAIN
VR101B B-GAIN
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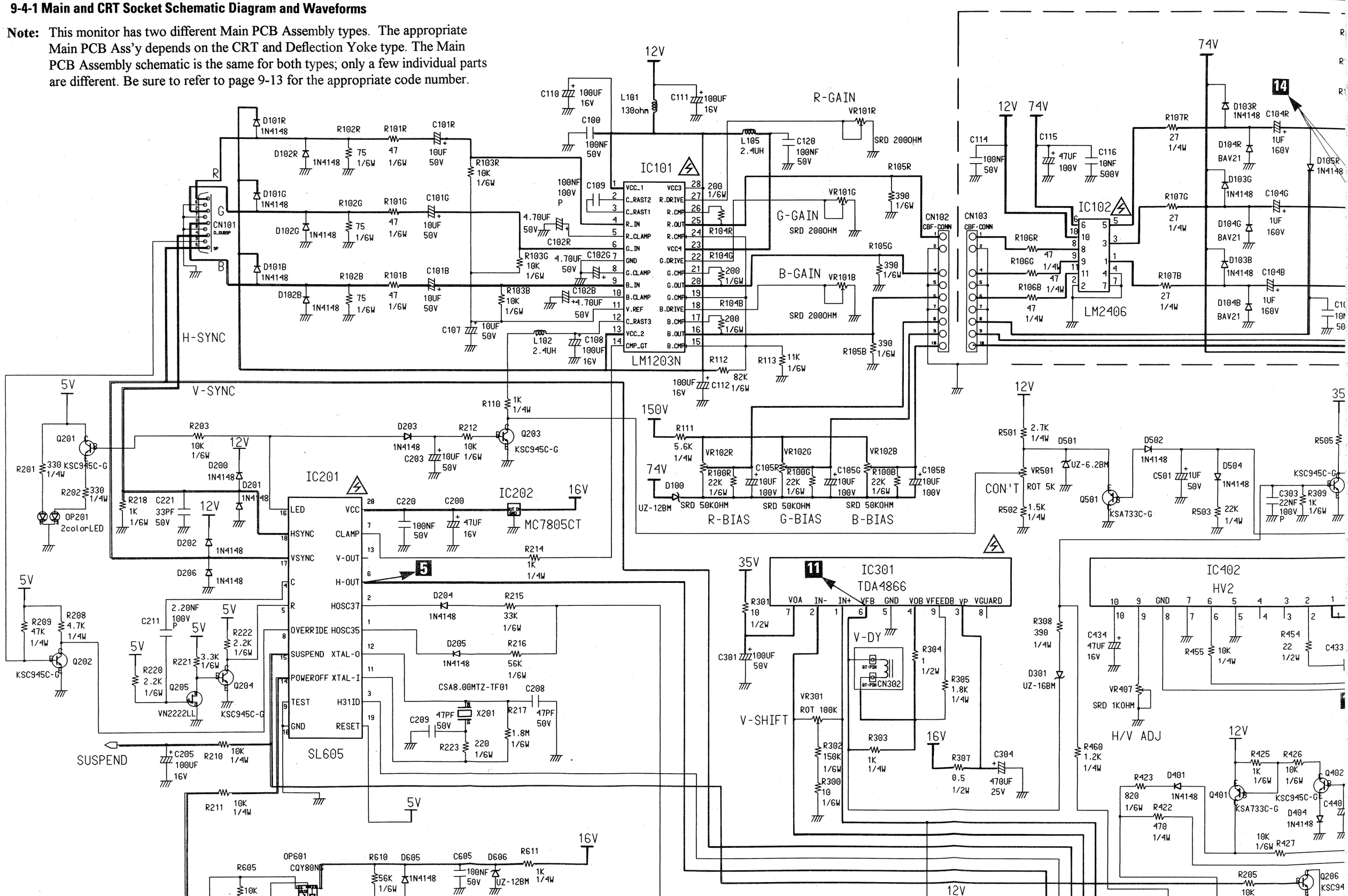
9-4 Schematic Diagram

9-4-1 Main and CRT Socket Schematic Diagram and Waveforms

Note: This monitor has two different Main PCB Assembly types. The appropriate Main PCB Ass'y depends on the CRT and Deflection Yoke type. The Main PCB Assembly schematic is the same for both types; only a few individual parts are different. Be sure to refer to page 9-13 for the appropriate code number.



: Power Line
: Signal Line

12V
L101 130ohm
C111 100UF 16V
C100 100NF 50V
R-GAIN
VR101R
SRD 2000HM
L105 2.4UH
C120 100NF 50V
R105R 390 1/6W
IC101
LM1203N
VCC_1 C_RAST2 C_RAST1 R_IN R_CLAMP G_IN GND G.CLAMP B_IN B.CLAMP V.REF C_RAST3 VCC_2 CMP_GT
VCC3 R.DRIVE R.CMP R.OUT R.CMP VCC4 G.DRIVE G.CMP G.OUT G.CMP B.DRIVE B.CMP B.OUT B.CMP
C109 100NF 100V P
C102G 4.70UF 50V
C102B 4.70UF 50V
C108 100UF 16V
R104R 200 1/6W
R104G 200 1/6W
R104B 200 1/6W
G-GAIN
VR101G
SRD 2000HM
B-GAIN
VR101B
SRD 2000HM
R105G 390 1/6W
R105B 390 1/6W
R112 82K 1/6W
R113 11K 1/6W
100UF 16V C112
CN102 CBF-CONN
CN103 CBF-CONN
74V
12V 74V
C114 100NF 50V
C115 47UF 100V
C116 10NF 500V
IC102
LM2406
R106R 47 1/4W
R106G 47 1/4W
R106B 47 1/4W
R107R 27 1/4W
R107G 27 1/4W
R107B 27 1/4W
D103R 1N4148
D104R BAV21
D103G 1N4148
D104G BAV21
D103B 1N4148
D104B BAV21
C104R 1UF 160V
C104G 1UF 160V
C104B 1UF 160V
D105R 1N4148
D105G 1N4148
D105B 1N4148
C106R 10NF 500V
C106G 10NF 500V
C106B 10NF 500V
14
R108B 470K 1/4W
R108G 470K 1/4W
R108R 470K 1/4W
R109R 100 1/2W
R109G 100 1/2W
R109B 100 1/2W
CRT1
CK101
M34KRH35X01(M)
PHI29-HIGH-FOCUS
FOCUS
G2
C113 100NF 50V
CN106
R114 100 1/4W
C117 10NF 1KV
L103 2.4UH
C118 10NF 500V
CN107
D106 1N4007GP
C119 3.30UF 250V
R115 2.2M 1/6W
D107 1N4007GP
C122 10NF 500V
12V
L106 2.4UH
CN104 CBF-CONN
CN105 CBF-CONN
12V 6.3V
150V
74V
35V
R507 12K 1/4W
R506 2.2M 1/4W
VR502 ROT-10K
BRT
R505 1.5K 1/4W
C502 100NF 250V MP
KSC945C-G
Q502
D505 BAV21
C303 22NF 100V P
R309 1K 1/6W
C643 100NF 50V
C645 100NF 50V
R801 100K 1W MO
C801 100NF 250V MP
D801 1N4937GP
150V
R111 5.6K 1/4W
VR102R
VR102G
VR102B
R100R 22K 1/6W
R100G 22K 1/6W
R100B 22K 1/6W
C105R 10UF 100V
C105G 10UF 100V
C105B 10UF 100V
74V
D100 SRD 50KOHM
UZ-12BM
R-BIAS
G-BIAS
B-BIAS
12V
R501 2.7K 1/4W
D501 UZ-6.2BM
VR501 ROT 5K
CON'T
R502 1.5K 1/4W
Q501 KSA733C-G
D502 1N4148
C501 1UF 50V
D504 1N4148
R503 22K 1/4W
35V
11
IC301
TDA4866
VOA IN- IN+ VFB GND VOB VFEEDB VP VGUARD
R301 10 1/2W
C301 100UF 50V
V-DY
GT-PIN GT-PIN CN302
R304 1 1/2W
R305 1.8K 1/4W
VR301 ROT 100K
V-SHIFT
R302 150K 1/6W
R300 10 1/6W
R303 1K 1/4W
16V
R307 0.5 1/2W
C304 470UF 25V
R308 390 1/4W
D301 UZ-16BM
IC402
HV2
10 9 GND 7 6 5 4 3 2 1
C434 47UF 16V
R455 10K 1/4W
R454 22 1/2W
C433 100NF 250V MP
VR407 SRD 1KOHM
H/V ADJ
R460 1.2K 1/4W
150V
D408 UZ9.1BL
Q408 IRF9610
D409 RG10V1
C441 560PF 500V
L403 ROBOT 3.2MH
68UF 160V
C432
EY410 EYE2.2
C435 100NF 250V MP
D405 1N4937GP
C414 100UF 50V
R434 100K 1/2W
EY402 EYE1.5
VR406 SRD 200K
SUB-BRT
T402
FCO-14A042
EY403 EYE1.5
EY409 EYE2.2
EY405 EYE1.5
EY401 EYE1.5
12V
R425 1K 1/6W
R426 10K 1/6W
Q401 KSA733C-G
Q402 KSC945C-G
R429 1K 1/6W
C440 1UF 50V
D404 1N4148
R427 10K 1/6W
D402 UZ-8.2BL
R430 4.7K 1/4W
R431 5.1K 1/6W
D403 1N4937GP
C413 470UF 16V
R423 820 1/6W
D401 1N4148
R422 470 1/4W
R205 10K
Q206 KSC945C-G
9
10

1 3.40 V (IC601 #4)
CH1 P-P = 3.40 V CH1 RMS = 590mV

2 17.6 V (IC601 #6)
CH1 P-P = 17.6 V CH1 RMS = 6.21V

3 16.2 V (T402 #5)
CH1 P-P = 16.2 V CH1 RMS = 4.23V

4 404 V (Q602 Drain)
CH1 P-P = 404 V CH1 RMS = 299.8 V

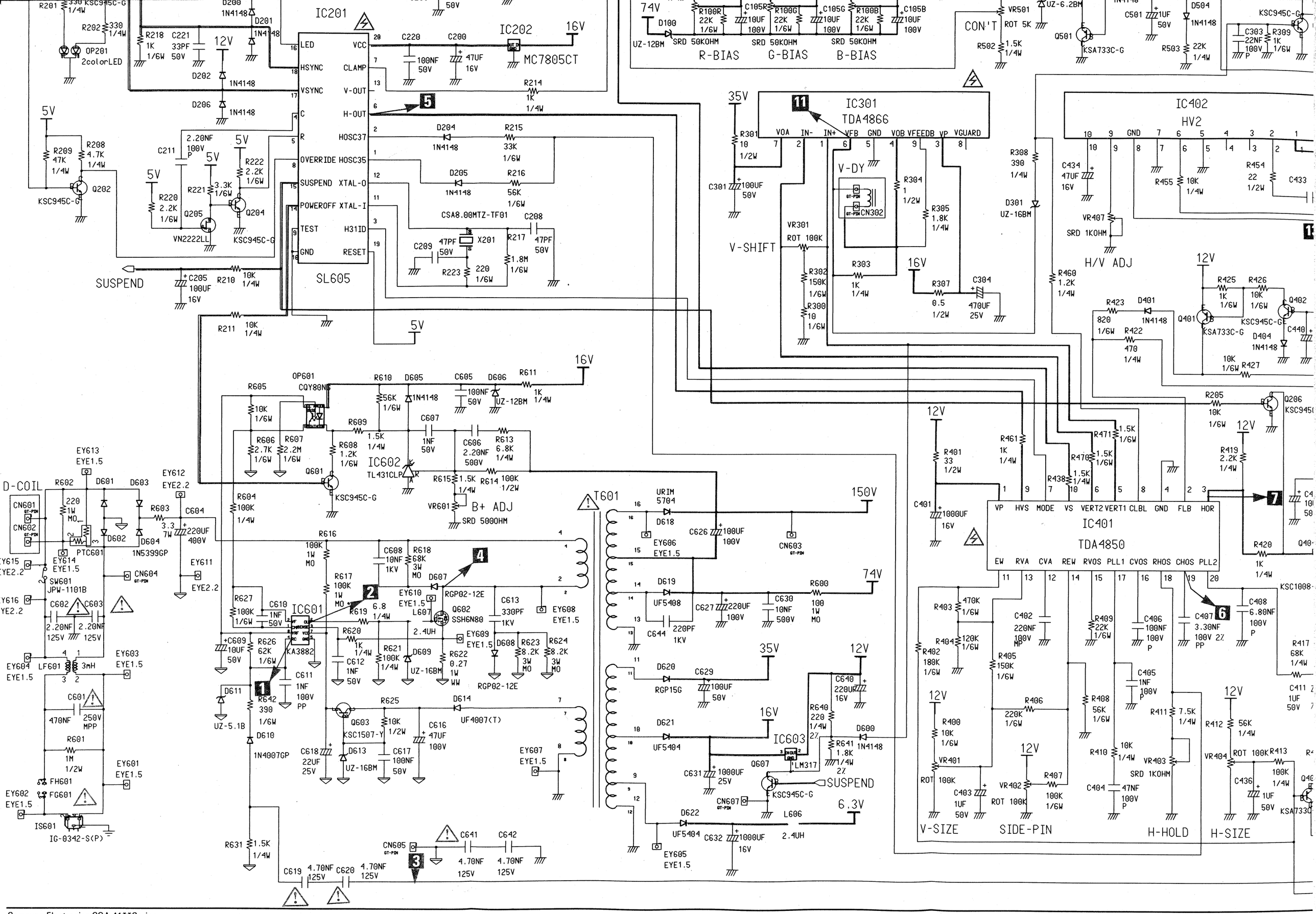
5 5.1 V (IC201 #6)
CH1 P-P = 5.1 V CH1 RMS

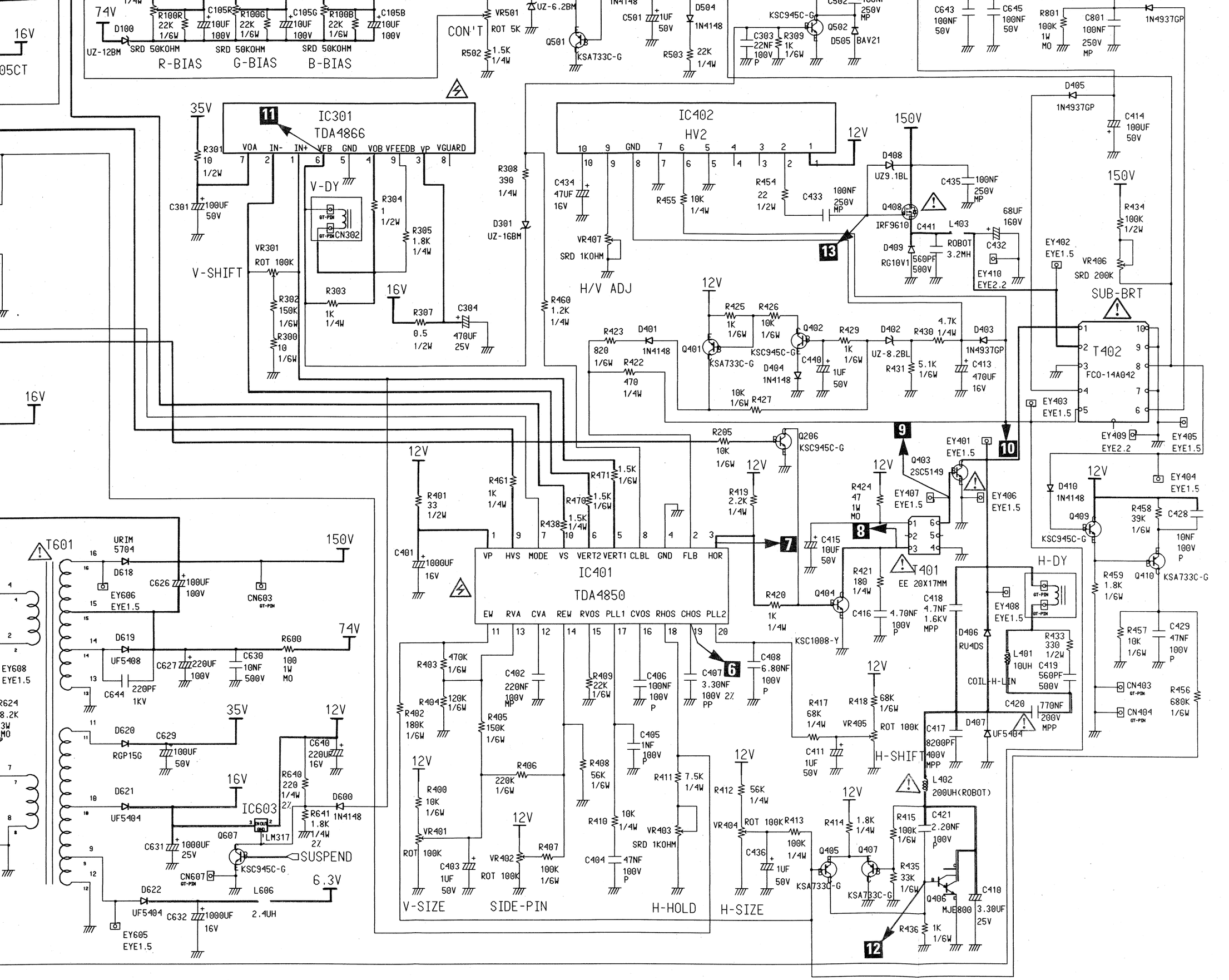
6 3.04V (IC401 #19)
CH1 P-P = 3.04 V CH1 RMS = 3.310V

7 4.8 V (IC401 #3)
CH1 P-P = 4.8 V CH1 RMS = 3.10V

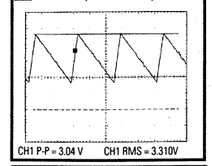
8 23.2 V (T401 #3)
CH1 P-P = 23.2 V CH1 RMS = 14.04 V

9 12.00 V (Q403 Base)
CH1 P-P = 12.00 V CH1 RMS = 1.264 V

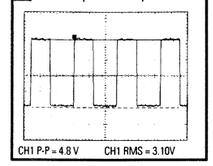

IC201
SL605
LED
HSYNC
VSYNC
C
R
OVERRIDE
SUSPEND
POWEROFF
TEST
GND
VCC
CLAMP
V-OUT
H-OUT
HOSC37
HOSC35
XTAL-O
XTAL-I
H31ID
RESET
IC202
MC7805CT
16V
12V
5V
SUSPEND
OP201
2colorLED
R201 330 1/4W KSC945C-G
R202 330 1/4W
R218 1K 1/6W
C221 33PF 50V
D200 1N4148
D201 1N4148
D202 1N4148
D206 1N4148
C220 100NF 50V
C200 47UF 16V
R214 1K 1/4W
R209 47K 1/4W
R208 4.7K 1/4W
Q202 KSC945C-G
C211 2.20NF 100V P
R220 2.2K 1/6W
R221 3.3K 1/6W
R222 2.2K 1/6W
Q205 VN2222LL
Q204 KSC945C-G
D204 1N4148
R215 33K 1/6W
D205 1N4148
R216 56K 1/6W
CSA8.00MTZ-TF01
X201
C208 47PF 50V
C209 47PF 50V
R223 220 1/6W
R217 1.8M 1/6W
C205 100UF 16V
R210 10K 1/4W
R211 10K 1/4W
IC301
TDA4866
VOA IN- IN+ VFB GND VOB VFEEDB VP VGUARD
R301 10 1/2W
C301 100UF 50V
V-DY
CN302
VR301 ROT 100K
V-SHIFT
R302 150K 1/6W
R300 10 1/6W
R303 1K 1/4W
R304 1 1/2W
R305 1.8K 1/4W
R307 0.5 1/2W
C304 470UF 25V
IC402
HV2
H/V ADJ
VR407 SRD 1KOHM
R460 1.2K 1/4W
R308 390 1/4W
D301 UZ-16BM
C434 47UF 16V
R454 22 1/2W
C433
R455 10K 1/4W
R425 1K 1/6W
R426 10K 1/6W
Q402 KSC945C-G
Q401 KSA733C-G
R423 820 1/6W
D401 1N4148
R422 470 1/4W
D404 1N4148
C440
R427 10K 1/6W
74V
D100 UZ-12BM
SRD 50KOHM
R-BIAS
G-BIAS
B-BIAS
R100R 22K 1/6W
C105R 10UF 100V
R100G 22K 1/6W
C105G 10UF 100V
R100B 22K 1/6W
C105B 10UF 100V
CON'T
VR501 ROT 5K
R502 1.5K 1/4W
UZ-6.2BM
Q501 KSA733C-G
C501 1UF 50V
D504 1N4148
R503 22K 1/4W
C303 22NF 100V P
R309 1K 1/6W
KSC945C-G
OP601
CQY80N
R605 10K 1/6W
R606 2.7K 1/6W
R607 2.2M 1/6W
R610 56K 1/6W
D605 1N4148
C605 100NF 50V
D606 UZ-12BM
R611 1K 1/4W
R609 1.5K 1/4W
R608 1.2K 1/6W
Q601 KSC945C-G
C607 1NF 50V
C606 2.20NF 500V
R613 6.8K 1/4W
IC602
TL431CLP
R615 1.5K 1/4W
R614 100K 1/2W
VR601 SRD 5000HM
B+ ADJ
R604 100K 1/4W
EY613 EYE1.5
EY612 EYE2.2
D-COIL
CN601
CN602
R602 220 1W MO
D601
D603
R603 3.3 7W
C604 220UF 400V
D602
D604 1N5399GP
PTC601
EY615 EYE2.2
EY614 EYE1.5
EY611
EY616 EYE2.2
CN604
SW601 JPW-1101B
C602 2.20NF 125V
C603 2.20NF 125V
EY604 EYE1.5
LF601 3mH
EY603 EYE1.5
C601 470NF 250V MPP
R601 1M 1/2W
FH601
FG601
EY602 EYE1.5
EY601 EYE1.5
IS601
IG-0342-S(P)
R616 100K 1W MO
R617 100K 1W MO
C608 10NF 1KV
R618 68K 3W MO
D607 RGP02-12E
EY610 EYE1.5
L607
Q602 SSH6N80
C613 330PF 1KV
EY608 EYE1.5
R627 100K 1/6W
C610 1NF 50V
IC601
KA3882
R619 6.8 1/4W
R620 1K 1/4W
C612 1NF 50V
R621 100K 1/4W
D609 UZ-16BM
R622 0.27 1W WW
2.4UH
EY609 EYE1.5
D608
R623 8.2K 3W MO
R624 8.2K 3W MO
RGP02-12E
C609 10UF 50V
R626 62K 1/6W
C611 1NF 100V PP
D611 UZ-5.1B
R642 390 1/6W
D610 1N4007GP
R625
Q603 KSC1507-Y
R612 10K 1/2W
C616 47UF 100V
D614 UF4007(T)
C618 22UF 25V
D613 UZ-16BM
C617 100NF 50V
EY607 EYE1.5
R631 1.5K 1/4W
CN605
C641 4.70NF 125V
C642 4.70NF 125V
C619 4.70NF 125V
C620 4.70NF 125V
T601
URIM 5704
D618
EY606 EYE1.5
C626 100UF 100V
CN603
150V
D619 UF5408
C627 220UF 100V
C644 220PF 1KV
C630 10NF 500V
R600 100 1W MO
74V
D620 RGP15G
C629 100UF 50V
35V
12V
D621 UF5404
16V
IC603
LM317
R640 220 1/4W 2%
C640 220UF 16V
D600 1N4148
R641 1.8K 1/4W 2%
C631 1000UF 25V
Q607 KSC945C-G
SUSPEND
CN607
L606 2.4UH
D622 UF5404
C632 1000UF 16V
6.3V
EY605 EYE1.5
R205 10K 1/6W
Q206 KSC945C
R419 2.2K 1/4W
R420 1K 1/4W
R401 33 1/2W
C401 1000UF 16V
R461 1K 1/4W
R471 1.5K 1/6W
R470 1.5K 1/6W
R438 1.5K 1/4W
IC401
TDA4850
VP HVS MODE VS VERT2 VERT1 CLBL GND FLB HOR
EW RVA CVA REW RVOS PLL1 CVOS RHOS CHOS PLL2
R403 470K 1/6W
R404 120K 1/6W
R402 180K 1/6W
R405 150K 1/6W
C402 220NF 100V MP
R409 22K 1/6W
C406 100NF 100V P
C407 3.30NF 100V 2% PP
C408 6.80NF 100V P
KSC1008
R417 68K 1/4W
C411 1UF 50V
R400 10K 1/6W
VR401 ROT 100K
C403 1UF 50V
R406 220K 1/6W
VR402 ROT 100K
R407 100K 1/6W
R408 56K 1/6W
C405 1NF 100V P
R410 10K 1/4W
C404 47NF 100V P
R411 7.5K 1/4W
VR403 SRD 1KOHM
R412 56K 1/4W
VR404 ROT 100K
R413 100K 1/4W
C436 1UF 50V
V-SIZE
SIDE-PIN
H-HOLD
H-SIZE



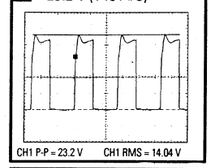
6 3.04V (IC401 #19)



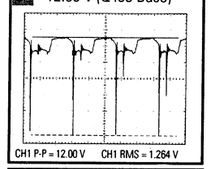
7 4.8 V (IC401 #3)



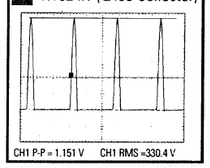
8 23.2 V (T401 #3)



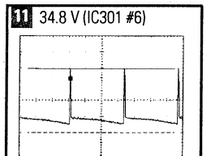
9 12.00 V (Q403 Base)



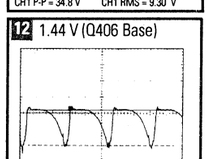
10 1.152 kV (Q403 Collector)



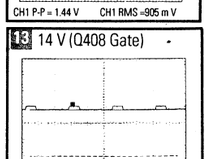
11 34.8 V (IC301 #6)



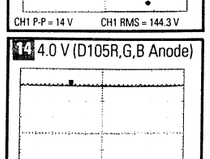
12 1.44 V (Q406 Base)



13 14 V (Q408 Gate)



14 4.0 V (D105R,G,B Anode)



9-3-2 Main & CRT Socket PCB Parts List (⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
CAPACITORS			
C100	C-CERAMIC 0.1UF 50V	915 336100HZVH	
C101B	C-AL-ELE.GP 10UF 50V	917 122100HM	
C101G	C-AL-ELE.GP 10UF 50V	917 122100HM	
C101R	C-AL-ELE.GP 10UF 50V	917 122100HM	
C102B	C-AL-ELE.GP 4.7UF 50V	917 121470HM	
C102G	C-AL-ELE.GP 4.7UF 50V	917 121470HM	
C102R	C-AL-ELE.GP 4.7UF 50V	917 121470HM	
C104B	C-AL-ELE.GP 1UF 160V	917 121100NM	
C104G	C-AL-ELE.GP 1UF 160V	917 121100NM	
C104R	C-AL-ELE.GP 1UF 160V	917 121100NM	
C105B	C-AL-ELE.GP 10UF 100V	917 122100LM	
C105G	C-AL-ELE.GP 10UF 100V	917 122100LM	
C105R	C-AL-ELE.GP 10UF 100V	917 122100LM	
C106B	C-CERAMIC CK 0.01UF 500V	915 325100VZVH	
C106G	C-CERAMIC CK 0.01UF 500V	915 325100VZVH	
C106R	C-CERAMIC CK 0.01UF 500V	915 325100VZVH	
C107	C-AL-ELE.GP 10UF 50V	917 122100HM	
C108	C-AL-ELE.GP 100UF 16V	917 123100CM	
C109	C-POLYESTER 104J 100V	916 166100LJAH	
C110	C-AL-ELE.GP 100UF 16V	917 123100CM	
C111	C-AL-ELE.GP 100UF 16V	917 123100CM	
C112	C-AL-ELE.GP 100UF 16V	917 123100CM	
C113	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C114	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C115	C-AL-ELE.GP 47UF 100V 105	917 742470LM	
C116	C-CERAMIC CK 0.01UF 500V	915 325100VZVH	
C117	C-CERAMIC 103K 1KV	915 325100XKPX	
C118	C-CERAMIC CK 0.01UF 500V	915 325100VZVH	
C119	C-AL-ELE.GP 3.3UF 250V	917 121330QM	
C120	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C121	C-MAYER 104J 100V	916 166100LJAH	
C122	C-CERAMIC CK	915 325100VZVH	
C200	C-AL-ELE.GP 16V	917 122470CM	
C203	C-AL-ELE.GP 10UF 50V	917 122100HM	
C205	C-AL-ELE.GP 100UF 16V	917 123100CM	
C208	C-CERAMIC CC 47PF 50V	915 312470HJXH	
C209	C-CERAMIC CC 47PF 50V	915 312470HJXH	
C211	C-POLYESTER 222J 100V	916 164220LJAH	
C220	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C221	C-CERAMIC CC45 33PF 50V	915 312330HJXH	
C301	C-AL-ELE.GP 100UF 50V	917 123100HM	
C303	C-POLYESTER 223J 100V	916 165220LJAH	
C304	C-AL-ELE.GP 470UF 25V	917 863470EMAH	
C401	C-AL-ELE.GP 1000UF 16V	917 864100CMAH	
C402	C-METAL POLYESTER 224K 100V	2305-000004	
C403	C-AL-ELE.GP 1UF 50V	917 121100HM	
C404	C-POLYESTER 473K 100V	916 165470LKAH	
C405	C-POLYESTER 102J 100V	916 164100LJAH	
C406	C-POLYESTER 104J 100V	916 166100LJAH	
C407	C-PP 332J 100V	916 354330LJAL	
C408	C-POLYESTER 682J 100V	916 164680LJAH	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
C410	C-AL-ELE.GP 3.3UF 25V NP	2401-000020	
C411	C-AL-ELE.GP 1UF 50V	917 121100HM	
C413	C-AL-ELE.GP 470UF 16V	917 863470CMAH	
C414	C-AL-ELE.GP 100UF 50V	917 123100HM	
C415	C-AL-ELE.GP 10UF 50V	917 122100HM	
C416	C-POLYESTER 472J 100V	916 164470LJAH	
C417	C-PP 822J 400V	2303-000002	
C418	C-PP 542J 1.6KV	2303-000003	
C419	C-CERAMIC CK-45 560PF 500V	915 323560VKPH	
C420	C-MPPF824J 200V	2306-000001	⚠
C421	C-POLYESTER 222J 100V	916 164220LJAH	
C428	C-POLYESTER 103J 100V	916 165100LJAH	
C429	C-POLYESTER 473K 100V	916 165470LKAH	
C432	C-AL-ELE.GP 68UF 160V	917 122680NM	
C433	C-METAL POLYESTER 104J 250V	916 556100QJAL	
C434	C-AL-ELE.GP 47UF 16V	917 122470CM	
C435	C-METAL POLYESTER 104J 250V	916 556100QJAL	
C436	C-AL-ELE.GP 1UF 50V	917 121100HM	
C440	C-AL-ELE.GP 1UF 50V	917 121100HM	
C441	C-CERAMIC CK-45 560PF 500V	915 323560VKPH	
C501	C-AL-ELE.GP 50V	917 121100HM	
C502	C-METAL POLYESTER 104J 250V	916 556100QJAL	
C601	C-MPPF 474K 250V AC	918 146470QK	⚠
C602	C-CERAMIC CK 2200PF 400VAC	915 344220MMVH	⚠
C603	C-CERAMIC CK 2200PF 400VAC	915 344220MMVH	⚠
C604	C-ELEC 220UF 400V 20% -25/105	917 793220TMFX	
C605	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C606	C-CERAMIC CK-45 2200PF 500V	915 324220VKPH	
C607	C-CERAMIC CK 102K 50V	915 324100HKPH	
C608	C-CERAMIC 103K 1KV	915 325100XKPX	
C609	C-AL-ELE.GP 10UF 50V	917 122100HM	
C610	C-CERAMIC CK 1000PF 50V	915 324100HKPH	
C611	C-PP 102J 100V	916 354100LJAL	
C612	C-CERAMIC CK 102K 500V	915 324100HKPH	
C613	C-CERAMIC CK 331J 1KV	915 323330XKPH	
C616	C-AL-ELE.GP 47UF 100V	917 742470LM	
C617	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C618	C-AL-ELE.GP 22UF 25V	917 122220EM	
C619	C-CERAMIC CK 4700PF 400VAC	915 344470MMVH	⚠
C620	C-CERAMIC CK 4700PF 400VAC	915 344470MMVH	⚠
C626	C-AL-ELE.GP 100UF 100V	917 123100LM	
C627	C-AL-ELE.GP 220UF 100V	917 123220LM	
C629	C-AL-ELE.GP 100UF 50V	917 123100HM	
C630	C-CERAMIC CK 0.01UF 500V	915 325100VZVH	
C631	C-AL-ELE.GP 1000UF 25V	917 124100EM	
C632	C-AL-ELE.GP 1000UF 16V	917 864100CMAH	
C634	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C640	C-AL-ELE.GP 220UF 16V	917 123220CM	
C642	C-CERAMIC CK 2200PF 250VAC	915 344220MMVH	⚠
C644	C-CERAMIC CK 220PF 1KV	915 323220XKPH	
C645	C-CERAMIC CK 0.1UF 50V	915 336100HZVH	
C801	C-MP 104J 250V	916 556100QJAL	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
CONNECTORS			
CN101	CONNECTOR D-SUB 2.77 15P MALE 9P 2.29 15P	935 100109AL	
CN102	SUB ASS'Y CONNECTOR 210MM 10P	BH39-40010A	●
CN103	SUB ASS'Y CONNECTOR 210MM 10P	BH39-40010A	●
CN104	SUB ASS'Y CONNECTOR 210MM 9P	BH39-40009A	●
CN105	SUB ASS'Y CONNECTOR 210MM 9P	BH39-40009A	●
CN106	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN107	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN301	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN302	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN401	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN402	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN403	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN404	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN601	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN602	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN603	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN604	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN605	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN606	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
CN607	BEAD PIN D2.36*14.1 BRASS SN	31-131-00012	
DIODES			
D100	Z-DIODE UZ12B	893 290031BB	
D101B	DIODE 1N4148	893 114148AANM	
D101G	DIODE 1N4148	893 114148AANM	
D101R	DIODE 1N4148	893 114148AANM	
D102B	DIODE 1N4148	893 114148AANM	
D102G	DIODE 1N4148	893 114148AANM	
D102R	DIODE 1N4148	893 114148AANM	
D103B	DIODE 1N4148	893 114148AANM	
D103G	DIODE 1N4148	893 114148AANM	
D103R	DIODE 1N4148	893 114148AANM	
D104B	DIODE BAV21	893 190021AANA	
D104G	DIODE BAV21	893 190021AANA	
D104R	DIODE BAV21	893 190021AANA	
D105B	DIODE 1N4148	893 114148AANM	
D105G	DIODE 1N4148	893 114148AANM	
D105R	DIODE 1N4148	893 114148AANM	
D106	DIODE 1N4007	893 314007BA	
D107	DIODE 1N4007	893 314007BA	
D200	DIODE 1N4148	893 114148AANM	
D201	DIODE 1N4148	893 114148AANM	
D202	DIODE 1N4148	893 114148AANM	
D203	DIODE 1N4148	893 114148AANM	
D204	DIODE 1N4148	893 114148AANM	
D205	DIODE 1N4148	893 114148AANM	
D206	DIODE 1N4148	893 114148AANM	
D301	Z-DIODE UZ16B	893 290031HB	
D302	DIODE 1N4937	893 314937AC	
D401	DIODE 1N4148	893 114148AANM	
D402	DIODE 1N4148	893 290031AA	
D403	DIODE 1N4937	893 314937AC	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
D404	DIODE 1N4148	893 114148AANM	
D405	DIODE 1N4937	893 314937AC	
D406	DIODE RU4DS	893 390045AA	
D408	Z-DIODE UZ9.1B	893 290035AF	
D409	DIODE RG10 / RG2	893 399016AA	
D410	DIODE 1N4148	893 114148AANM	
D501	Z-DIODE UZ6.2B	893 290031SB	
D502	DIODE 1N4148	893 114148AANM	
D504	DIODE 1N4148	893 114148AANM	
D505	DIODE BAV21	893 190021AANA	
D601	DIODE 1N5399GP	893 315399AA	
D602	DIODE 1N5399GP	893 315399AA	
D603	DIODE 1N5399GP	893 315399AA	
D604	DIODE 1N5399GP	893 315399AA	
D605	DIODE 1N4148	893 114148AANM	
D606	Z-DIODE UZ12B	893 290031BB	
D607	DIODE RGP02-12E	02169-206-297	
D608	DIODE RGP02-12E	02169-206-297	
D609	Z-DIODE UZ16B	893 290031HB	
D610	DIODE 1N4007	893 314007BA	
D611	Z-DIODE UZ5.1B	893 290031FB	
D613	Z-DIODE UZ16B	893 290031HB	
D614	DIODE UF4007	893 394007AA	
D620	DIODE RGP15G/FF1504	893 390015AD	
D407	RECTIFIER DIODE UF5404	893 399044AA	
D618	DIODE 1R5NU41 / UR1M-5704	893 399032AA	
D619	RECTIFIER DIODE UF5408	893 395408AA	
D621	RECTIFIER DIODE UF5404	893 399044AA	
D622	RECTIFIER DIODE UF5404	893 399044AA	
D801	DIODE 1N4937	893 314937AC	
ICS			
IC101	IC-LINEAR 1203 RGB VIDEO AMP 28	881 101203AA	⚠
IC102	LM2406T	1204-000010	● ⚠
IC201	IC-CUSTOM SL605 ASIC DIP-20	885 460008AA	⚠
IC202	IC REGULATOR 78M05 0.5A 5V	881 307805KANE	
IC301	TDA4866	1204-000009	⚠
IC401	IC-LINEAR DIP-20 TDA4850 HV DEF CONTROLLER	1204-000011	⚠
IC402	IC HYBRID SC-428VS(VI) HV2	BH13-10002A	
IC601	IC-LINEAR DIP-8 KA3882 PWA CONTROLLER	881 903882AA	
IC602	IC-REGULATOR 431C PROGRAMMABLE PRECISION	881 300431TANB	
IC603	KA317,(LM317)	881 300317KANC	
COILS			
L101	FILTER CORE 130 OHM	02429-048-017	
L102	FILTER CORE 2.4UH,5.5MM,BEAD,0.032OHM	937 120211AA	
L103	FILTER CORE 2.4UH,5.5MM,BEAD,0.032OHM	937 120211AA	
L105	FILTER CORE 2.4UH,5.5MM,BEAD,0.032OHM	937 120211AA	
L106	FILTER CORE 2.4UH,5.5MM,BEAD,0.032OHM	937 120211AA	
L401	COIL H-LIN 10UH 30%	BH27-20006A	
L402	COIL CHOKE 200UH 10%	BH27-20004A	⚠
L403	COIL CHOKE 3.2MH 10%	925 460181SA	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
L606	FILTER CORE 2.4UH 5.5MM,BEAD 0.032OHM	937 120211AA	
L607	FILTER CORE 2.4UH 5.5MM,BEAD 0.032OHM	937 120211AA	
TRANSISTORS			
Q201	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q202	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q203	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q204	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q205	FET-N VN2222LL,0.23A,60V,TO-92"	891 892222AA	
Q206	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q401	TR-NPN KSA733C-G	891 190733AD	
Q402	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q403	TR-2SC51491	891 465149AA	⚠
Q404	TR-NPN KSC1008Y /KTA1266Y /1015Y	891 391008XA	
Q405	TR-NPN KSA733C-G	891 190733AD	
Q406	MJE800 / KSE800	21-115-00131	
Q407	TR-NPN KSA733C-G	891 190733AD	
Q408	IRF9610	891 799610AA	⚠
Q409	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q410	TR-NPN KSA733C-G	891 190733AD	
Q501	TR-NPN KSA733C-G	891 190733AD	
Q502	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q603	TR KSC1507Y 0.2A 300V 15W	891 491507AB	
Q601	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
Q602	STH6NA80FI	891 890680AA	
Q607	TR-NPN KSC945CY /KTC3198Y /1815Y	891 390006BCNA	
RESISTORS			
R100B	R-CARBON 22K 1/6W 5%	911 152207YA	
R100G	R-CARBON 22K 1/6W 5%	911 152207YA	
R100R	R-CARBON 22K 1/6W 5%	911 152207YA	
R101B	R-CARBON 47 1/4W 5%	911 124707DA	
R101G	R-CARBON 47 1/4W 5%	911 124707DA	
R101R	R-CARBON 47 1/4W 5%	911 124707DA	
R102B	R-CARBON 75 1/4W 5%	911 127507DA	
R102G	R-CARBON 75 1/4W 5%	911 127507DA	
R102R	R-CARBON 75 1/4W 5%	911 127507DA	
R103B	R-CARBON 10K 1/6W 5%	911 151007YA	
R103G	R-CARBON 10K 1/6W 5%	911 151007YA	
R103R	R-CARBON 10K 1/6W 5%	911 151007YA	
R104B	R-CARBON 200 1/6W 5%	911 132007YA	
R104G	R-CARBON 200 1/6W 5%	911 132007YA	
R104R	R-CARBON 200 1/6W 5%	911 132007YA	
R105B	R-CARBON 390 1/6W 5%	911 133907YA	
R105G	R-CARBON 390 1/6W 5%	911 133907YA	
R105R	R-CARBON 390 1/6W 5%	911 133907YA	
R106B	R-CARBON 47 1/4W 5%	911 124707DA	
R106G	R-CARBON 47 1/4W 5%	911 124707DA	
R106R	R-CARBON 47 1/4W 5%	911 124707DA	
R107B	R-CARBON 27 1/4W 5%	911 122707DA	
R107G	R-CARBON 27 1/4W 5%	911 122707DA	
R107R	R-CARBON 27 1/4W 5%	911 122707DA	
R108B	R-CARBON 470K 1/4W 5%	911 164707DA	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
R108G	R-CARBON 470K 1/4W 5%	911 164707DA	
R108R	R-CARBON 470K 1/4W 5%	911 164707DA	
R109B	R-CARBON 100 1/2W 5%(S)	911 131007FF	
R109G	R-CARBON 100 1/2W 5%(S)	911 131007FF	
R109R	R-CARBON 100 1/2W 5%(S)	911 131007FF	
R110	R-CARBON 1K 1/4W 5%	911 141007DA	
R111	R-CARBON 5.6K 1/4W 5%	911 145607DA	
R112	R-CARBON 82K 1/6W 5%	911 158207YA	
R113	R-CARBON 11K 1/6W 5%	14-121-01137	
R114	R-CARBON 100 1/4W 5%	911 131007DA	
R115	R-CARBON 2.2M 1/6W 5%	911 172207YA	
R201	R-CARBON 330 1/4W 5%	911 133307DA	
R202	R-CARBON 330 1/4W 5%	911 133307DA	
R203	R-CARBON 10K 1/6W 5%	911 151007YA	
R205	R-CARBON 10K 1/6W 5%	911 142707YA	
R208	R-CARBON 4.7K 1/4W 5%	911 144707DA	
R209	R-CARBON 47K 1/4W 5%	911 154707DA	
R210	R-CARBON 10K 1/4W 5%	911 151007DA	
R211	R-CARBON 10K 1/4W 5%	911 151007DA	
R212	R-CARBON 10K 1/6W 5%	911 151007YA	
R214	R-CARBON 1K 1/4W 5%	911 141007DA	
R215	R-CARBON 33K 1/4W 5%	911 153307DA	
R216	R-CARBON 56K 1/4W 5%	911 155607DA	
R217	R-CARBON 1.8M 1/6W 5%	911 141807YA	
R218	R-CARBON 1K 1/6W 5%	911 141007YA	
R220	R-CARBON 2.2K 1/6W 5%	911 142207YA	
R221	R-CARBON 3.3K 1/6W 5%	911 143307YA	
R222	R-CARBON 2.2K 1/6W 5%	911 142207YA	
R223	R-CARBON 220 1/6W 5%	911 132207YA	
R301	R-CARBON 100 1/2W 5%(S)	911 131007FF	
R302	R-CARBON 68K 1/6W 5%	911 156807YA	
R303	R-CARBON 1K 1/4W 5%	911 141007DA	
R304	R-CARBON 1 1/2W (S)5%	911 111007FF	
R305	R-CARBON 2.2K 1/4W 5%	911 142207DA	
R307	R-CARBON 0.5 1/2W (S)5%	911 105007FF	
R308	R-CARBON 390 1/4W 5%	911 133907DA	
R309	R-CARBON 1K 1/6W 5%	911 141007YA	
R400	R-CARBON 10K 1/6W 5%	911 151007YA	
R401	R-CARBON 33 1/2W 5%(S)	911 123307FF	
R402	R-CARBON 180K 1/6W 5%	911 161807YA	
R403	R-CARBON 470K 1/6W 5%	911 164707YA	
R404	R-CARBON 120K 1/6W 5%	911 161207YA	
R405	R-CARBON 150K 1/6W 5%	911 161507YA	
R406	R-CARBON 220K 1/6W 5%	911 162207YA	
R407	R-CARBON 100K 1/4W 5%	911 161007DA	
R408	R-CARBON 56K 1/6W 5%	911 155607YA	
R409	R-CARBON 18K 1/6W 5%	911 151807YA	
R410	R-CARBON 10K 1/4W 5%	911 151007DA	
R411	R-CARBON 7.5K 1/4W 5%	911 147507DA	
R412	R-CARBON 56K 1/4W 5%	911 155607DA	
R413	R-CARBON 100K 1/4W 5%	911 161007DA	
R414	R-CARBON 1.8K 1/4W 5%	911 141807DA	

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
R415	R-CARBON 100K 1/6W 5%	911 161007YA	
R417	R-CARBON 68K 1/4W 5%	911 156807DA	
R418	R-CARBON 68K 1/6W 5%	911 156807YA	
R419	R-CARBON 2.2K 1/4W 5%	911 142207DA	
R420	R-CARBON 1K 1/4W 5%	911 141007DA	
R421	R-CARBON 180 1/4W 5%	911 131807DA	
R422	R-CARBON 470 1/4W 5%	911 134707DA	
R423	R-CARBON 820 1/6W 5%	911 138207YA	
R424	R-M.O 47 1W 5% 63MM(T)	911 324707GA	
R425	R-CARBON 1K 1/6W 5%	911 141007YA	
R426	R-CARBON 10K 1/6W 5%	911 151007YA	
R427	R-CARBON 10K 1/6W 5%	911 151007YA	
R429	R-CARBON 1K 1/6W 5%	911 141007YA	
R430	R-CARBON 4.7K 1/4W 5%	911 144707DA	
R431	R-CARBON 7.5K 1/6W 5%	911 147507YA	
R433	R-CARBON 330 1/2W 5%(S)	911 133307FF	
R434	R-CARBON 100K 1/2W 5%(S)	911 161007FF	
R435	R-CARBON 33K 1/6W 5%	911 153307YA	
R436	R-CARBON 1K 1/6W 5%	911 141007YA	
R438	R-CARBON 1.5K 1/4W 5%	911 141507DA	
R454	R-CARBON 22 1/2W 5%(S)	911 122207FF	
R455	R-CARBON 10K 1/4W 5%	911 151007DA	
R456	R-CARBON 680K 1/6W 5%	911 166807YA	
R457	R-CARBON 10K 1/6W 5%	911 151007YA	
R458	R-CARBON 39K 1/6W 5%	911 153907YA	
R459	R-CARBON 1.8K 1/6W 5%	911 141807YA	
R460	R-CARBON 1.2K 1/4W 5%	911 141207DA	
R461	R-CARBON 1K 1/4W 5%	911 141007DA	
R470	R-CARBON 1.5K 1/6W 5%	911 141507YA	
R471	R-CARBON 1.5K 1/6W 5%	911 141507YA	
R501	R-CARBON 2.7K 1/4W 5%	911 142707DA	
R502	R-CARBON 1.5K 1/4W 5%	911 141507DA	
R503	R-CARBON 22K 1/4W 5%	911 152207DA	
R505	R-CARBON 1.5K 1/4W 5%	911 141507DA	
R506	R-CARBON 2.2M 1/4W 5%	911 172207DA	
R507	R-CARBON 12K 1/4W 5%	911 151207DA	
R600	R-M.O 100 1W 5%	911 331007GF	
R601	R-CARBON 1M 1/2W 5%(S)	911 171007FF	
R602	R-M.O(S) 220 1W 5%	911 332207GF	
R603	R-CEMENT 3.3 7W	911 613307QP	
R604	R-CARBON 100K 1/4W 5%	911 161007DA	
R605	R-CARBON 10K 1/6W 5%	911 151007YA	
R606	R-CARBON 2.7K 1/6W 5%	911 142707YA	
R607	R-CARBON 2.2M 1/6W 5%	911 172207YA	
R608	R-CARBON 1.2K 1/6W 5%	911 141207YA	
R609	R-CARBON 1.5K 1/4W 5%	911 141507DA	
R610	R-CARBON 56K 1/6W 5%	911 155607YA	
R611	R-CARBON 1K 1/4W 5%	911 141007DA	
R613	R-CARBON 6.8K 1/4W 5%	911 146807DA	
R614	R-CARBON 100K 1/2W 5%(S)	911 161007FF	
R615	R-CARBON 1.5K 1/4W 5%	911 141507DA	
R616	R-M.O 100K 1W 5% 63MM(T)	911 361007GF	
R617	R-M.O 100K 1W 5% 63MM(T)	911 361007GF	

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Loc. No.	Description	Code No.	Remarks
R618	R-M.O 68K 3W 5% 63MM(T)	911 356807LF	
R619	R-CARBON 6.8 1/4W 5%	911 116807DA	
R620	R-CARBON 1K 1/4W 5%	911 141007DA	
R621	R-CARBON 100K 1/4W 5%	911 161007DA	
R622	R-W.W 0.27 1W 5%	911 602707GU	
R623	R-M.O 8.2K 3W 5% 63MM(T)	911 348207LF	
R624	R-M.O 8.2K 3W 5% 63MM(T)	911 348207LF	
R625	R-CARBON 10K 1/2W 5%(S)	911 151007FF	
R626	R-CARBON 62K 1/6W 5%	911 156207YA	
R627	R-CARBON 100K 1/6W 5%	911 161007YA	
R631	R-CARBON 1.5K 1/4W 5%	911 141507DA	
R640	R-CARBON 220 1/4W 2%	14-133-02214	
R641	R-CARBON 1.8K 1/4W 2%	14-133-01826	
R642	R-CARBON 390 1/4W 2%	911 133907DA	
R801	R-M.O 100K 1W 5% 63MM(T)	911 361007GF	
VARIABLE RESISTORS			
VR101B	VAR.NO-HANDLE H-TYPE 200 ,B,0.1W	913 432008BF	
VR101G	VAR.NO-HANDLE H-TYPE 200 ,B,0.1W	913 432008BF	
VR101R	VAR.NO-HANDLE H-TYPE 200 ,B,0.1W	913 432008BF	
VR102B	VAR.NO-HANDLE H-TYPE 50K,B,0.1W	913 455008BF	
VR102G	VAR.NO-HANDLE H-TYPE 50K,B,0.1W	913 455008BF	
VR102R	VAR.NO-HANDLE H-TYPE 50K,B,0.1W	913 455008BF	
VR-ARRY-5	VR-ARRY H-TYPE 100K*5 0.05W	2105-000001	
VR403	VAR.NO-HANDLE H-TYPE 2K ,B,0.1W	913 442008BF	
VR406	VAR.NO-HANDLE H-TYPE 200K,B,0.1W	913 462008BF	
VR407	VAR.NO-HANDLE H-TYPE 1K ,B,0.1W	913 441008BF	
VR-ARRY-2	VR-ARRY H-TYPE 10K/5K 0.05W	2105-000002	
VR601	VAR.NO-HANDLE H-TYPE 500 ,B,0.1W	913 435008BH	
TRANSFORMER			
T401	TRANS H-DRIVE 10MH/70UH	BH26-30009A	● ⚠
T402	FBT FCO-14A042	923 460164DA	● ⚠
T601	TRANS POWER 115/230V	BH26-20001A	● ⚠
OTHERS			
X201	RESONATOR 8.000MHZ 2P	941 210030AA	●
CRT/GND	CDT GND.471P/472P 660mm,400mm,2P,255mm	BH39-40006A	
D/COIL	COIL DEGAUSSING 115+/-ITS,0.45,13.7UH,1040mm	BH27-10001A	
P/CORD	CORD POWER NOR DETACH 1850mm,IVY	BH39-10001A	●
S/CABLE	CABLE SIGNAL DETACH 1300mm 15P 9P IVORY	955 460512AAAA	
FBT-CORE	CORE-RING FERRITE CORE	3301-000001	●
FG601	FUSE TIME-LUG W/O LEAD 3.15A 250V 5*20MM	949 115105THNA	⚠
FH601	FUSE CLIP 5.20*20MM,(T)	953 260023BC	
FH602	FUSE CLIP 5.20*20MM,(T)	953 260023BC	
IS601	FILTER EMI SOCKET 250V 3A 1.2MH	943 150034BA	
J1-101	JUMPER CU+SN+PB 1ST 1x0.6 SAD	955 005001AAAA	
LF601	FILTER LINE 15MH MIN	BH27-20012A	●
OP201	LED GREEN/RED SPR-39MVW3.25MA	0601-000003	
OP601	IC PTO-COUPLER CQY80XG	895 520080AB	
PTC601	POSISTOR POSI,14 OHM,SQUARE	1404-000003	●
PCB	PCB-MAIN 247*330,FR-1,1.6T	BH41-10004A	●
SW601	SWITCH PUSH SPST 5A/80A 250VAC	3403-000001	●
SK1	CON-JACK CRT SOCKETPH129-HIGH FOCUS	935 720901AESA	

Memo

Memo

(⚠ : Caution, ● : Specialty part for this monitor only, ⚠ : ESD Caution)

Loc. No.	Description	Code No.	Remarks
CRT S/T	M34KRH35 X 01, CQA41**, SAMSUNG SDD	897 250177BA	⚠ 0.28 Northern
CRT S/T	M34KRH35 X 01(M), CQA41**, SAMSUNG SDD	897 250177CA	⚠ 0.28 Equator
CRT S/T	M34KRH35 X 01(R), CQA41**, SAMSUNG SDD	897 250177DA	⚠ 0.28 Southern
CRT S/T	M34KRH35 X 01(B), CQA41**, SAMSUNG SDD	897 250177AA	⚠ 0.28 Bio
CRT S/S	M34KUH35 X 02, CQA41**, SAMSUNG SDD MPRII	897 250178CA	⚠ 0.28 Northern
CRT S/S	M34KUH35 X 02(M), CQA41**, SAMSUNG SDD MPRII	897 250178DA	⚠ 0.28 Equator
CRT S/S	M34KUH35 X 02(R), CQA41**, SAMSUNG SDD MPRII	897 250178EA	⚠ 0.28 Southern
CRT S/T	M34KRK55 X 13, CQA41**, SAMSUNG SDD	897 250069AA	⚠ 0.39 Northern
CRT S/T	M34KRK55 X 13(M), CQA41**, SAMSUNG SDD	897 250143AA	⚠ 0.39 Equator
CRT S/T	M34KUK55 X 01/11, CQA41**, SAMSUNG SDD VLMF	897 250109AA	⚠ 0.39 Northern
CRT S/S	M34KUK55 X 02/12, CQA41**, SAMSUNG SDD MPRII	897 250105AA	⚠ 0.39 Northern
MAIN-PCB ASSY	NORMAL CRT, S/T TYPE	BH92-50003A	
MAIN-PCB ASSY	MPRII CRT, S/S TYPE	BH92-50026A	
C420	C-MPPF 824J 200V	2306-000001	NORMAL
C420	C-MPPF 774J 200V	2306-000002	MPRII
C418	C-PP 542J 1.6KV	2303-000003	NORMAL
C418	C-PP 472J 1.6KV	916 354470YJAX	MPRII
CRT-GND	CRT GND 471P/472P; 660mm, 400mm	BH39-40006A	NORMAL
CRT-GND	CRT GND 471P/472P; 660mm, 400mm	BH39-40007A	MPRII
R303	R-CARBON 1K 1/4W 5%	911 141007DA	NORMAL
R303	R-CARBON 470 1/2W (S)	911 134707FF	MPRII
R305	R-CARBON 2.2K 1/4W 5%	911 142207DA	NORMAL
R305	R-CARBON 1.5K 1/4W 5%	911 141507DA	MPRII
R405	R-CARBON 75K 1/6W 5%	911 157507YA	NORMAL
R405	R-CARBON 150K 1/6W 5%	911 161507YA	MPRII

Note: This monitor has two different Main PCB Assembly types. The appropriate Main PCB Ass'y depends on the CRT and Deflection Yoke type. The Main PCB Assembly design is the same for both types; only a few individual parts are different. Be sure to refer to the list above for the appropriate code number.

9-4 Schematic Diagrams

Caution

1. The areas shaded or marked with ⚠ on the schematic diagram and parts list designate components which have special characteristics important for safety. Replace these parts only with parts identical to those in the original circuit or specified in the parts list. Before replacing any of these components carefully read the "Product Safety Notice."
2. When taking measurements, pay special attention to the following:

   1) Do not use your instrument between primary ground (symbol ⏚) and secondary circuit.

   2) Do not use your instrument between secondary ground (symbol ⏚) and primary circuit.

Warning

This equipment contains safety critical components. All parts shown with the ⚠ mark on the schematic are safety critical.

Replace safety critical parts with only manufacturers recommended parts. See parts list for exact replacements.

Note

1. Resistance is shown in OHM. K = 1000 M = 1,000,000 and the rated power of resistors not noted in schematic diagram is 1/4W.
2. Capacitance is shown in μF. Capacitances not otherwise noted are shown in pF (1μF = 1,000,000 pF). Rated voltage of condensers not otherwise noted in schematic diagram is 50 V.
3. Abbreviations and Symbols

MO	R-METAL OXIDE	WW	R-WIRE WOUND
FU	FUSIBLE	C	R-COMPOSITION
CM	R-CEMENT MPP METAL POLYPROPYLENE		
MP	C-METAL POLYESTOR	PP	C-POLYPROPYLENE
P	C-POLYESTOR	T	C-TANTALIUM
⏚	HOT GROUND	⏚	COLD GROUND

4. The secondary voltage is read with an SSVM from the indicated point to cold ground (⏚). The primary voltage is read with an SSVM from the indicated point to hot ground (⏚).
5. This schematic diagram is subject to change without notice.